COAL AGE

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Commission Acts Decisively

WHATEVER may be your viewpoint on the present coal situation all must agree that the Interstate Commerce Commission has acted quickly and decisively. A virtual embargo for a time on foreign exports of coal and an actual embargo on the use of open-top cars in the area east of the Mississippi for any purpose other than loading coal is a program that reminds us of war days. We may next expect a Lake car-priority order, for the Northwest will expect treatment equal to New England's.

The tidewater order will lower prices offered New England, expedite contract shipments coastwise, quickly satisfy the New England demand and raise export prices. Positive assurance of supplies will take the edge off the Boston appetite for coal.

The general order affecting the use of open-top cars in Eastern territory, coupled with the previous mandate ordering such equipment across the Mississippi is drastic and shows how seriously the situation is viewed at Washington. Before the end of the thirty days provided in the order production of bituminous coal will reach 12,000,000 tons and may go higher, *unless* railroad labor troubles again break out in protest against the delay in the award of the Railway Wage Board.

The stoppage of foreign shipments can be but temporary. Mr. Storrow, we are advised, will be satisfied with less than 1,000,000 net tons a month, an increase of about 300,000 tons over what New England is getti .. now. And having satisfied the preference for coastwise movement and the navy, the agents of the commission are free to permit bunker and export cargoes to load.

It is worth noting in passing that we are now following in effect the policy of Great Britain in the control of coal. The Board of Trade through the British coal controller restricts exports of coal from the United Kingdom to the extent necessary to protect the requirements of consumers at home, which, of course, is just what the commission has done in its order of June 19.

Coal Freight Increases

JUST because the freight rate has little or no influence on coal movement today and differentials have for the time ceased to determine markets, the coal men are not neglecting the opportunity to put in the record on rate increases now being taken by the Interstate Commerce Commerce Commission their conflicting views. The Commission is gathering evidence on which to base a general rate increase sufficient to afford the railroads a "living wage." The National Coal Association put into the record the resolution passed at its third annual convention last month (*Coal Age* June 3, page 1162) endorsing the plea of the roads for increased revenues. Individual operators and representatives of producing fields, however, have appeared before the Commission and befogged the issue by selfish claims. What the Commission needs in these troublsome days is help, not more tangles to untie.

How much better it would have been for the operators to have joined through the National Coal Association in a presentation to the Commission that showed clearly the main contention that the first consideration should be to restore the old differentials in coal rates, disturbed by the more or less uneven advance of June, 1918! What has happened, it appears, is that such fields as suffered by the change of that date have asked for readjustment, and those fields that were not affected or were favored have asked even better treatment.

It would seem that the way could have been left open to settle these local differences at some future date and to have now put forth a united front on the question of coal rates. How can anyone accuse the coal industry of being a trust and to represent a monopoly when every national issue finds such a lack of common purpose and lack of common leadership? The presentation of the coal man's case to the Commission is so confused by local contentions that the decision when given cannot be other than disappointing.

The Significance of the World Market for Coal

IN the new order of things, participation in the affairs of the world is inescapable, the Republican party to the contrary. A year ago the State Department was seriously debating the advisability of our attempting to participate in the export coal business on a large scale. It was pointed out that notwithstanding the control of foreign business by the British and despite our national desire to save the best of our coal for use in this country, the United States would soon find itself in the position of the only dependable source of coal for the world.

Whereas in 1913 the United Kingdom produced some 320,000,000 net tons of coal and exported 106,000,000 net tons or nearly 33 per cent of the total, in 1919 production was but 257,000,000 net tons of which about 52,700,000 net tons or 20.5 per cent was export cargo. The average per month in 1919 was 4,400,000 net tons compared with which we learn that 2,200,000 net tons were shipped from the United Kingdom in the month of April, 1920, or less than 12 per cent of the total output that month.

In the meantime exports by sea from the United States have been increasing. From the low figure of 3,740,000 net tons or less than .7 per cent of the output of the country in 1918, off shore export cargo shipments increased to 8,291,000 net tons or 1.8 per cent of the total in 1919. In April, 1920, cargo shipments from Atlantic ports reached the high figure of 1,903,000 net tons or 5 per cent of domestic production. The present rate of dumping for export is at the rate of nearly

24,000,000 net tons a year. The maximum performance of the railroads and piers at Atlantic ports was in 1918 when 44,500,000 net tons of bituminous coal were dumped at these piers for all purposes.

British opinion on the question of the world market in coal is well expressed by the editor of *The Compendium*, who says that "The [British] export trade has been arbitrarily suspended to insure necessary supplies of coal at home. Never was there such an opportunity for our export coal trade as at present. But the country is impotent to grasp it, and, meanwhile America has stepped in the breach and is literally sweeping the coal trade of Europe into her lap." This authority also states that "old time customers in Europe are weary of trying to get coal from Britain. They are sick to death of strikes, delays, and control confusion, and they turn gladly to America for relief." But not to America alone, for Indian and Natal coals are reaching the Mediterranean and in far off Australia coal has been sold for use in France.

Compare $10 or $15 a ton at Hampton Roads with 140s. in May at Cardiff. At the present rate of exchange 140s. is about $28. The difference in shipping rates from the two sources to Continental ports is all that will prevent prices on this side from climbing still higher.

The wise policy for the United States is to stay in the world market for coal, for no sooner is the railroad situation straightened out than we will find ourselves with overproduction of coal again and need the foreign outlet as never before. The lack of output here and in Great Britain is due to different causes—there to lack of mine capacity and man power, here to deficiencies in transportation. We can and will overcome our failing long before England can recuperate her productive capacity, and in the meantime the world needs our coal.

What the Mine Pump Has Done for Industry

INDUSTRY has forgotten what it owes to the mine pump, yet mining with its pumping needs gave industry no less an instrument than the steam engine. Newcomen's engine, invented in 1705, was in 1711 employed for pumping mines. Not until it was applied to this purpose did it have any useful outcome. Humphrey Potter's invention for opening and shutting the valves on the engine was made on a mine pump and Henry Beighton's plug-tree with tappets was invented in 1718 for the same purpose. Then came Smeaton, the great mine-pump builder. James Watt busied himself with a model of a mine pump in 1763.

Not until 1781 did Watt introduce the "sun-and-planet" device that turned the reciprocating motion into one of revolution and converted the mine pump into a steam engine suited for varied industrial purposes. Thus, for fifty-two years the mine pump led the way in the utilization of steam for power purposes. In 1769 came the discovery that steam could be used expansively and in 1782 a patent was issued to Watt covering its use in this manner. In the same year he developed the use of steam by applying it to both ends of the cylinder. From then on the mine pump became an engine for a multitude of industrial uses. Thus is the mine pump father to the factories and the factory systems of the world.

The work of pumping, with reciprocating motion, which is most economically performed at a low rate of speed, just suited the gait of the single-acting atmospheric engine with condensation provided first of all by conducted heat, and then by a spray which lowered the temperature of the cylinder walls and made the action of the piston slow. The work of pumping seemed to be ideally adapted to steam power. It was often proposed, it is true, to use the steam engine to drive mills, but how? By raising water and using the water to turn a wheel. Denis Papin, as far back as 1690, proposed this use of his embryonic invention.

But when we celebrate the mine pump as the father of steam engines, we must not forget how much mining has owed to the mine pump. Without any satisfactory data to back the statement, it may be asserted without fear of contradiction that little of the coal in Europe and 50 per cent of the coal now being mined in America would have to remain underground if there were no mine pumps. There are large areas in mines that are roughly described as self-draining which are dependent on the mine pump for their development and operation. With what difficulty would coal operations be conducted if it were not for this necessary adjunct of coal mining?

Service and Servitude

IN THE three-hour debate between Governor Allen and Samuel Gompers on the rights of the public and of the union members in labor disputes the paramount question was propounded by the Kansas executive thus:

"When a dispute between capital and labor brings on a strike affecting the production or distribution of the necessaries of life, thus threatening the public peace and impairing the public health, has the public any rights in such a controversy, or is it a private war between capital and labor?"

Mr. Gompers did not give a satisfactory answer to this question. In fact he carefully evaded it, directing his efforts to proving that abridgment of the right of men to quit work made slaves of them.

After an interval of ten days Mr. Gompers gave out a carefully-prepared supplementary reply. In this, however, particularly for such an earnest, forthright spokesman, Mr. Gompers was scarcely any more satisfactory than in the debate with Governor Allen, being still insistent that "the public has no rights which are superior to the toiler's right to live and defend himself against oppression."

The fundamental issue is not the right to quit but the right to strike—matters apparently similar but actually different.

The inference that Mr. Gompers draws—that any man would or could be forced to work against his will—is peurile. The right of any man to quit work at any time is unquestioned. Carefully-planned strikes like those of the railroad switchmen and coal miners are another matter. Impending paralysis of industry, threats of starvation and freezing, intimidation of those willing to work, unless the demands of labor leaders are met, are what Governor Allen seeks to prevent.

By such methods the public is made an unwilling accessory to as vicious a conspiracy in restraint of trade as the Sherman anti-trust act was ever invoked to suppress. Through appeal to the primary instinct of self-preservation the consumer is enlisted as an unwilling but potent ally, who to prevent a calamity must bear the burden of the cost.

Commission Takes Drastic Steps to End Coal Shortage East of Mississippi River

New England Given Preference and Priority in Transportation of Coal to Tidewater—J. J. Storrow Named as Consignee—Open-Top Cars Denied to All Commodities Except Coal for Thirty Days

EFFECTIVE June 24, the Interstate Commerce Commission has ordered that coal for New England shall have priority in transportation. The order was issued June 19. With that order came another providing for the preferential use of open-top cars for coal loading. The latter order became effective June 21 and is to continue for thirty consecutive days.

Embargo on Coal Exports Was Feared

While considerable relief is felt that the commission did not order an out-and-out embargo on coal exports, it is believed that a modification of the priority order will have to be made in the very near future. With the Shipping Board order assigning 500,000 tons of additional shipping to the New England coal trade and with the priority order insuring the prompt loading of all vessels which are made available, it is expected that great congestion will ensue at New England ports. It is stated that dock capacity and means of inland distribution are entirely inadequate to handle the volume of coal which is certain to move to New England ports under these orders.

The priority order is the direct result of a visit to Washington of James J. Storrow and five New England governors. In fact, Governor Coolidge of Massachusetts was the only New England governor who was not a member of the party. Massachusetts, however, was represented by Mr. Storrow, who was fuel administrator for New England during the war.

Unsettling Industrial Effects Feared

It is feared that the priority order in favor of New England will have dire effects in depriving industries of coal. Carrying out of the New England order may shut down a large proportion of byproduct coke ovens. Textile mills are almost certain to have to close, along with many other industries which secure their coal from the regions which will be drawn upon most heavily by New England.

It was a great relief to coal men when the New England order was accompanied by instructions to give coal mines first call on open-top cars. This will insure an adequate car supply at most mines and is expected to bring out the maximum production during the period of the order. It is understood, however, that the thirty-day period will be extended if conditions warrant.

The order, of course, has called forth tremendous protest from other industries using open-ton cars. The constructional industries are particularly vehement in their representations. The housing situation is such as to have resulted, it is asserted, in a nationwide demand for the government to embark in the construction of houses, so as to insure shelter for the population.

During the war, it is pointed out, constructional materials were placed at the bottom of the preferential list. Since then, the Interstate Commerce Commission is informed, cars have been available to handle only ten per cent of the building materials offered for transportation. Second to the pressure being brought against any further curtailment of cars available for building materials, it is the demand that road construction be allowed to continue. Because of congestion on the railroads, highways are being used to an unprecedented extent, and have come to form a transportation channel second only to the railroads themselves. To cut off materials for their maintenance and extension is only to aggravate the situation still further.

Other industries using open-top equipment are working tirelessly to have set aside the preferential assignment of open-top cars for coal. The commission is being told that cars are not used efficiently in the coal trade. Even an aeroplane has been employed from which to make photographs of long lines of coal cars which have been standing for long periods under load. Figures are being gathered at many points to show that coal cars are neither promptly loaded nor unloaded.

Complete Text of the Priority Order

The text of the Interstate Commerce Commission's service order No. 6, which covers priority for New England coal, reads as follows, in its entirety:

It appearing in the opinion of the commission that because of a shortage of equipment and congestion of traffic, aggravated by unfavorable labor conditions which continue to exist upon the lines of each and all common carriers by railroad within official classification territory and Southern classification territory subject to the Interstate Commerce Act, and further because of the inability of said common carriers properly and completely to serve the public, and especially in the matter of transportation of bituminous coal to New England, an emergency exists which requires immediate action, particularly with respect to the transportation of bituminous coal to tidewater coal transshipment piers at and north of Charleston, S. C., for transshipment by water to coastwise points within the United States:

It is ordered that the common carriers by railroad hereinbefore described be, and they are hereby, authorized and directed, effective June 24, 1920, and until the further order of the commission, in the transportation of bituminous coal consigned to any tidewater coal transshipment pier at or north of Charleston, S. C., and in the supply of cars therefor, and in the movement of such traffic, (a) to give preference and priority to carloads of such coal consigned to James J. Storrow, whose address is Boston, Mass., as a part of a pool or pools of bituminous coal at any such port for transshipment by water to any New England coastwise destination, or consigned as a part of a pool or pools of bituminous coal at any such port for transshipment by water to any United States coastwise destination other than New England; and (b) to furnish transportation of bituminous coal and cars therefor, consigned to any of said ports either for bunkerage or for cargo purposes, only upon a permit and direction therefor issued by J. W. Howe, commissioner, Tidewater Coal Exchange, Inc., New York, for piers within New York Harbor, Philadelphia, Pa., and Baltimore, Md.; by E. I. Ford, commissioner, Newport News Coal Exchange, Newport News, Va., for piers at

Newport News, Va.; by E. M. Graham, manager, Lamberts Point Coal Exchange, Norfolk, Va., for piers at Lamberts Point, Norfolk, Va.; by S. T. Snead, commissioner, Sewells Point Coal Exchange, Norfolk, Va., for piers at Sewells Point, Norfolk, Va.; and by Frank McCabe, general agent Southern Railway Co., Charleston, S. C., for piers at Charleston, S. C., each of whom is hereby designated as an agent of the commission therefor; which permit and direction shall be issued only upon a showing that the destination of the water movement of such coal is a United States coastwise point, or if otherwise that the preference and priority hereby directed will not be impeded thereby, and in any event that the shipper or consignee will be able to unload such coal at the port of transshipment without delay to the rail equipment.

It is further ordered that each of said common carriers by railroad shall establish such rules and regulations respecting the placement of cars for unloading and of vessels for loading at such piers as will effect the preference and priority in transportation hereby directed, including the dumping of cars.

Terms of the Preferential Order on Cars

Service order No. 7, in regard to the preferential use of open-top cars for coal, reads, in full, as follows:

It appearing in the opinion of the commission that because of a shortage of equipment and congestion of traffic, aggravated by unfavorable labor conditions which continue to exist upon the lines of each and all the common carriers by railroad subject to the Interstate Commerce Act within the territory east of the Mississippi River, and because of the inability of said common carriers properly and completely to serve the public in the transportation of coal, an emergency exists which requires immediate action:

It is ordered that such common carriers by railroad in the aforesaid territory which serve coal mines, whether located upon the line of said railroad or customarily dependent upon it for car supply (herein termed coal-loading carriers), be and they are hereby, authorized and directed for the period of thirty consecutive days beginning with June 21, 1920, to furnish such coal mines with open-top cars suitable for the loading and transportation of coal (herein termed coal cars) in preference to any other use, supply, movement, distribution, exchange, interchange, or return of such coal cars, provided that such coal cars may be used in service moving in the direction of the mine or mines to be supplied on the return movement, after the discharge of the coal lading thereof, upon a route not materially out of line and to points not beyond such mine or mines.

It is further ordered that all common carriers by railroad within said territory other than coal-loading carriers (herein termed non-coal-loading carriers) be, and they are hereby, authorized and directed during said period to deliver daily to a connecting coal-loading carrier or carriers empty or loaded coal cars up to the maximum ability of each such non-coal-loading carrier to make such deliveries and of each such connecting coal-loading carrier to receive and use the coal cars so delivered for the preferential purposes herein set forth.

It is further ordered that all such common carriers by railroad within said territory be, and they are hereby, authorized and directed forthwith and during said period to discontinue the use of coal cars for transportation of commodities otherwise than as hereinbefore specified (a) as to each coal-loading carrier, so long as any coal mine remains to be served by it with coal cars, and (b) as to each non-coal-loading carrier, so long as deliveries of any coal cars to connecting carriers may be due or remain to be performed under the terms of this order.

It is further ordered that all common carriers by railroad within the territory hereinbefore described be, and they are hereby, authorized and directed, effective June 23, 1920, and until the further order of the commission, to place an embargo against the receipt of coal by any consignee, and against the placement of coal cars for consignment to any consignee, who shall fail or refuse to unload coal placed for unloading within twenty-four hours after such placement, until all coal so placed has been unloaded by such consignee, provided that this authorization and direction shall not interfere with the movement of coal under permit to any coal pool or pools when authorized by any order heretofore or hereafter entered by the commission.

It is further ordered that all rules, regulations and practices of said carriers with respect to car service are hereby suspended in so far only as conflicting with the directions hereby made; and that the authorizations and directions herein contained are to be considered as not conflicting with or superseding any service order heretofore entered by the commission.

Northwest Asks for Lake Car Priority Order

W. H. Groverman, for Northwestern Dock Interests, Says Assigned Cars Are Essential to Supply Coal Required

FEARING that the arguments of the five New England governors might induce the Interstate Commerce Commission to divert coal to New England at the expense of the Lakes, W. H. Groverman, secretary of the Northwest Coal Operators' Association, presented the claims of the Northwest immediately following the representations made by the New England interests. He told representatives of the Interstate Commerce Commission that the matter of securing coal for the Northwest is much more urgent than the problem which confronts New England, since the Lakes are open for traffic an average of only 165 days per year. One-third of the season of navigation has passed and only an insignificant proportion of the coal needs of the Northwest has been transported. Mr. Groverman delivered to Commissioner Clark what he termed the ultimatum of the Northwest, which was a demand for assigned cars for Lake shipments so as to insure 100-per cent car supply for the mines supplying this fuel.

Lake Supplies Far Below Requirements

On June 1 only 1,800,000 tons of coal had been dumped at lower Lake Erie ports. On the corresponding date of last year 5,225,000 tons had been dumped. Moreover last year a surplus of 2,000,000 tons was left on the upper Lake docks at the close of winter. The coming of spring this year found those docks entirely bare of coal and they are still bare. The 250,000 tons which have reached Lake Superior ports passed immediately to consumers. The same is true of the 150,000 tons which were moved to Lake Michigan ports. These figures do not include, of course, shipments made for the account of steel and copper companies.

Mr. Groverman pointed out to Commissioner Clark that it is physically possible to move the requirements of the Northwest after July 1 but that it is inadvisable to delay the movement of this coal a single day. Mr. Groverman estimates the requirements of the Lake Superior commercial docks for the coming winter at 15,000,000 tons and those of Lake Michigan at 8,000,000 tons. This is in addition to the tonnage required for the industrial docks.

There is no demand in the Northwest for an embargo on the exports of coal. It is felt that New England should be willing to take its coal later in the season, if necessities require, since with two or three insignificant exceptions the New England ports do not become icebound. Moreover it was pointed out that New England already is a month in advance of the average year in the matter of fuel stocks.

How the Valier Shaft Mine Was Quickly Developed for Large Daily Output—I

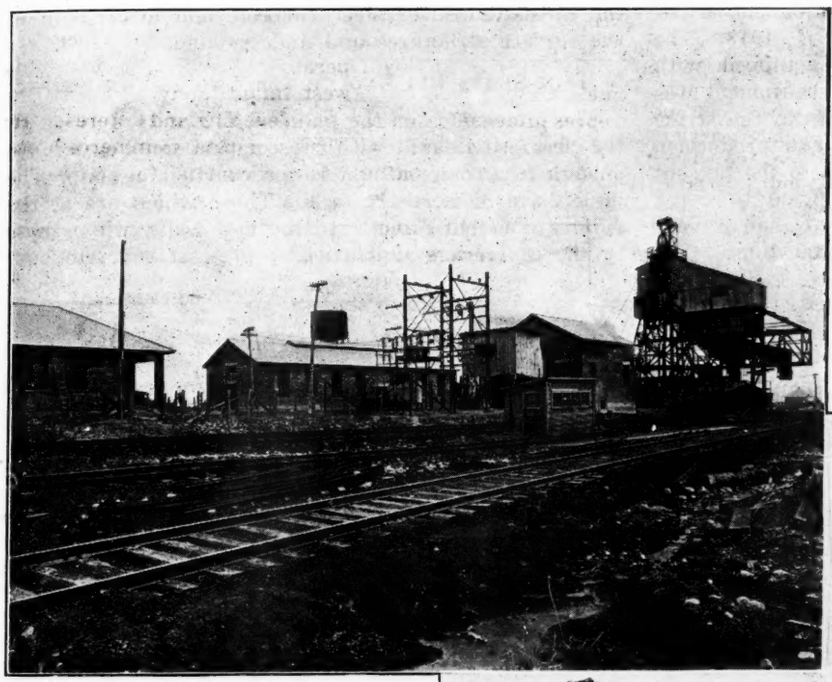
Ultimate Production Will Be Eight to Ten Thousand Tons Per Day —Coal Is Hoisted in 15-ton Skips the Coal Being Dumped Out of the Mine Cars Near the Foot of Shaft by a Two-car Rotary Dump

By Carl Scholz
Charleston, W. Va.

SAFETY, conservation and economy were the three cardinal objectives which the owners of the property sought, when I was placed in charge of this new development, to have embodied in the Valier Mine of Franklin County, Illinois. To be more detailed, the ends sought were safety for the men and property above all else, conservation of the coal supply (meaning a maximum extraction) with an equipment that would permit of the greatest economy and provide a large daily production.

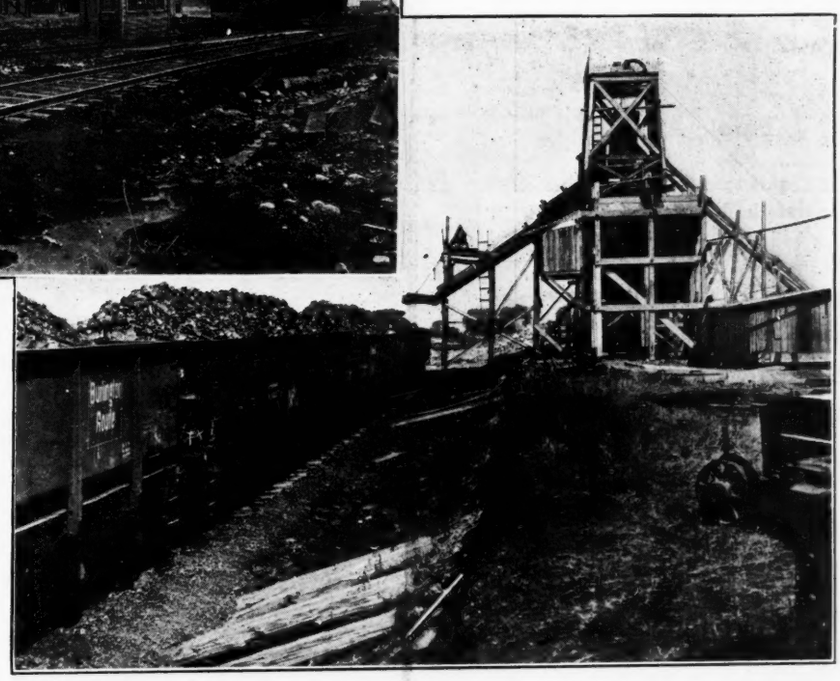
The company owns the coal rights on some 13,000 acres of land which is underlaid with the No. 6 bed. This seam ranges in thickness from 8½ to 12 ft. and lies at a depth of 620 ft. The coal is of quality as high as any found in Illinois, and the fuel requirements of the Chicago, Burlington & Quincy R. R. Co.'s fuel are largely supplied from this field. All the existing conditions called for a mine with a large production—large even for Franklin County, where more mines of big output are now located than in any other equal area in the United States.

The mine site lies on the southward side of a ridge the crest of which is one mile north of the town of Valier, which occupies the opposite hillside. The slope



Plant of Valier Mine

On the right is the tipple of the airshaft; in the center, the track-scale house and transformer station; in the background, the shops, and on the left, the office building.



Temporary Tipple

Rough structure built over main shaft and used for the hoisting of coal till the airshaft was lined. The hoist used for sinking served temporarily for winding, and a temporary skip transported the coal.

affords natural drainage and grade for the railroad yards, while the town site also is favored with exceptional drainage for a flat country. Power for operation is purchased. This solution of the power problem was largely influenced by the absence of a suitable water supply.

Shaft sinking was started in September, 1917, and the coal was reached in May, 1918. The shafts were temporarily curbed with wood, but were later lined from top to bottom with well reinforced concrete lining, varying in thickness from 8 to 26 in., this thickness depending upon the nature of the strata penetrated.

Main Shaft to Produce 6,500 Tons Per Day

As soon as the bed was reached in the main shaft, hoisting of coal was started, the sinking engine by means of which the shaft had been sunk and a temporary skip being used for that purpose. Simultaneously the airshaft was receiving its concrete lining and being equipped with a tipple and permanent hoist. This hoist was put into service on Nov. 1, 1918. The main shaft was then concreted and equipped with permanent machinery. This permanent equipment was put in service on Oct. 1, 1919, and prior to the strike which commenced Nov. 1 of that year a production of 3,000 tons per day was attained. Up to the present date the maximum output has been 3,500 tons per day, but by the end of the present calendar year the production will have risen to 5,000 tons. The normal production of the mine is to be about 6,500 tons per day, although by hoisting from both shafts, 8,000 or even 10,000 tons of coal can readily be raised with the equipment and track layout available.

Considering the serious obstacles encountered, such as the severe winter of 1917-18, the shortage of men arising from the army draft and the "flu" epidemic, also the difficulties in obtaining material, it is believed that this mine has reached a larger tonnage in less time than has heretofore been attained in the district.

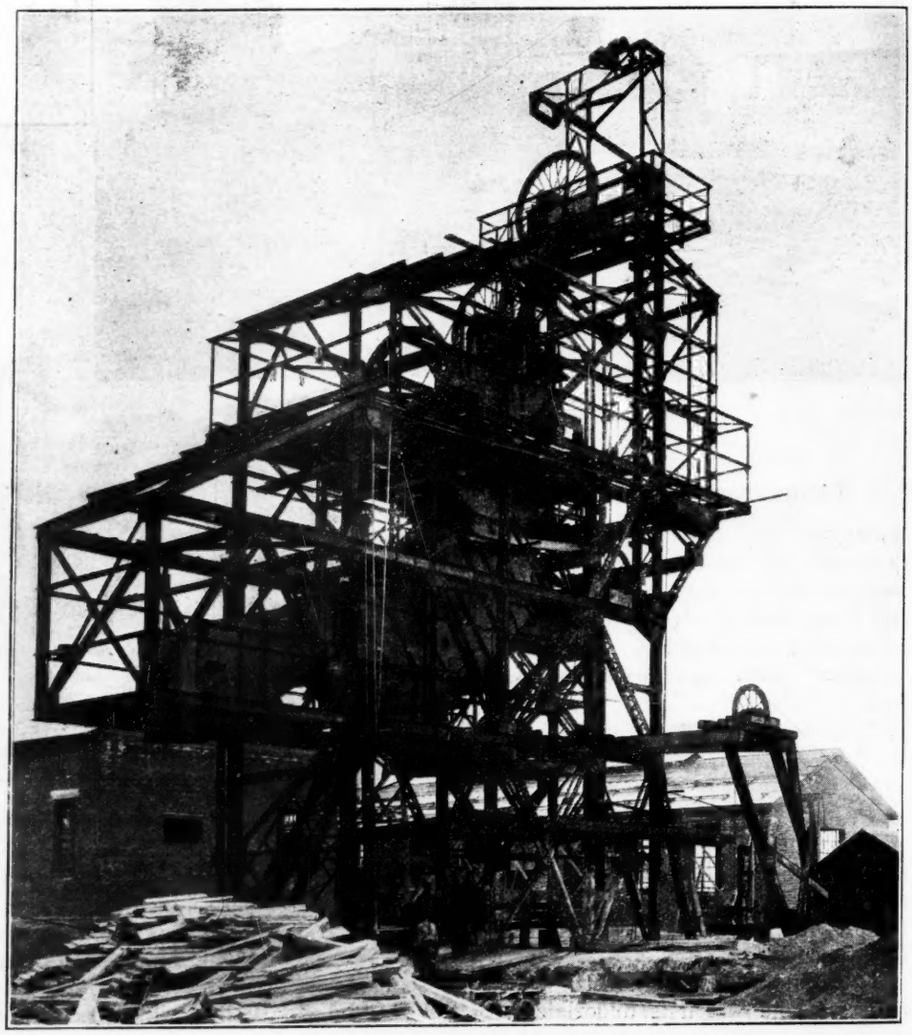
While no radical departures were made in the way of equipment and methods, the plant as constructed represents machinery of the most modern type, and it is believed that it will be economy to extract at least 6,000 acres of coal through the shaft. The accompanying illustrations show the mine in its various stages of development. In the brief description of the plant which now follows special attention is called to the exclusive use of steel, concrete and brick, both in the surface structures and underground.

Main Shaft Big Enough for Two 15-Ton Skips

The dimensions of the main shaft are 11 x 19 ft. in the clear. It is built with two compartments each large enough to accommodate a 15-ton overturning skip. The guides are 85-lb. track rails. Those which are at the sides are bolted directly to the end walls, while those in the center are supported by pre-cast concrete bun-

Tipple Airshaft

This sturdy headframe was built of old bridge steel on account of the high cost and scarcity of iron products during the war period. The photograph from which this illustration was made was taken when the tipple was still under construction. The shaft is 13 x 30 ft. in the clear and has four compartments. It had to be built wide enough to accommodate mining machines, electric locomotives and the standard Valier mine cars, which are 10 ft. 9 in. long.



tons. At the bottom of the shaft is located a two-car rotary dump, the coal being spilled directly from this into the skips, its flow being directed by a butterfly valve. The sump extends some 50 ft. below the level of the coal and is equipped with a conveyor for the removal of waste, as well as with a small pumping station.

The airshaft is 30 x 13 ft. in the clear and contains four compartments. The air compartment, 9 ft. wide, is separated from the others by a 12-in. concrete wall so that ventilation of the mine can be effected through the airshaft, allowing the main shaft to remain entirely neutral. A steel stairway occupies the second compartment. A single-platform cage counterbalanced by a two-story hoisting cage, on which men and counterweights can be handled, is installed for the hoisting of men and material and also can be utilized for the hoisting of coal.

Shaft Will Accommodate Locomotives

The shaft was made as wide as 13 ft. because it had to accommodate long mine cars and locomotives. The equipment and cages are heavy enough to permit the hoisting of motors, mining machines and other machinery to the surface shop without dismantling. In this shaft are also installed the necessary pipes for water and air as well as electric cables. The signal wires in both shafts are installed in 3-in. pipes imbedded in the concrete lining. They are thereby protected from injury should any material or other objects fall down either of the shafts.

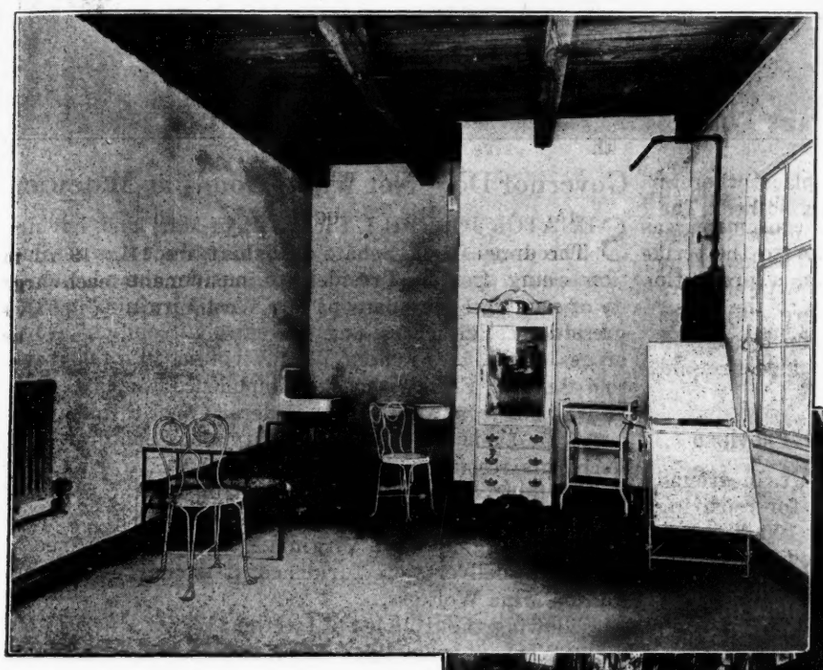
Surface Buildings Substantially Built

The tipple at the main shaft is a 5-track steel structure. It is equipped with a large hopper from which the coal is discharged by means of a feeder to the shaker screen. Two picking tables and loading booms are provided for the handling of lump and egg. The tipple also contains a coal crusher and a box-car loader.

The airshaft tipple is a two-track structure, equipped with a bar screen and 50-ton hopper and contains a single-car rotary dump. It can be utilized for the hoisting of coal for local sales as well as for the raising of rock, but is primarily intended to handle the men and materials to and from the mine.

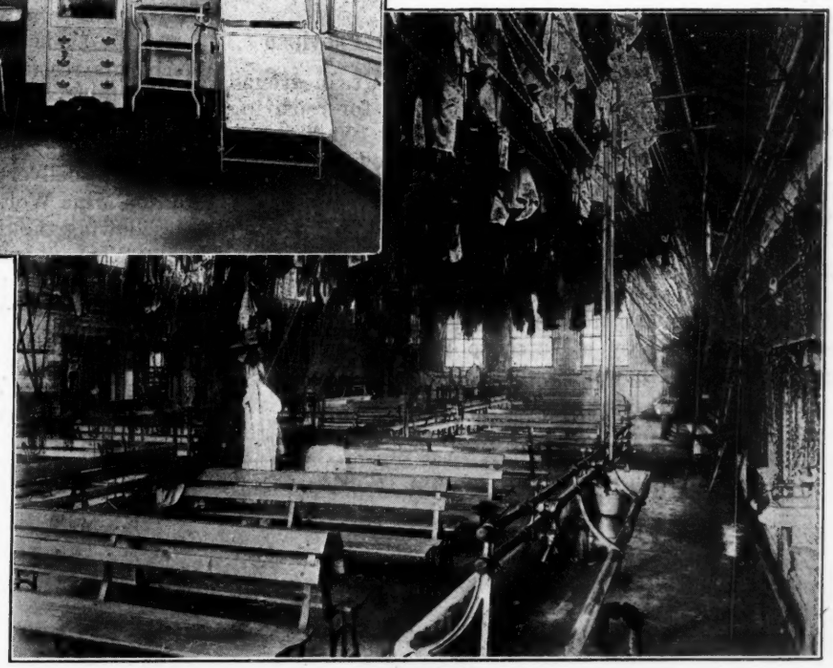
The other surface buildings are built of brick and roofed with asbestos shingles. They have been located with a view to serving their purpose most conveniently. They are so placed that increases in sizes can be made should the expansion of the mine require it. All buildings are heated by steam supplied from the washhouse boiler.

The washhouse, with a change room accommodating some 600 men, is equipped with overhead clothes hangers and comfortable benches. It is well heated and venti-



First-Aid Station

A corner of the bathhouse has been set apart for a first-aid room which is simply but appropriately equipped for the reception of anyone who may be injured about the plant.



Washhouse Interior

Here is seating room for 500 mine workers and clothes hangers for some 600 men. Note the "bubbler" over against the wall to supply drinking water to the thirsty and three wash troughs for those who desire only partial ablutions.

Lamphouse

Valier mine lies 630 ft. or more below the rolling prairie and so it makes gas. A lamphouse has been constructed as an adjunct to the bathhouse and here 800 electric safety lamps are housed and tended.

lated and provides a most convenient place wherein employees may wash up and change their clothes. The two shower rooms, separated from the main change room, are equipped with twenty shower baths. The washhouse also contains a foreman's office, with showers and lavatories; a timekeeper's office where employees are checked in and out of the mine; a lamp house containing some 800 storage-battery lamps and a first-aid room.

Completely Equipped Repair Plant Provided

The machine and repair shop, 35 x 100 ft. in ground plan, is equipped with the necessary tools for repairing mining machines and locomotives. A 35 x 100 ft. warehouse has been constructed. This is provided with a track running through the center of the building and leading directly to the shaft. The office building has the necessary accommodations for the general office force and engineers.

The fan house contains a 5 x 14 ft. fan driven by a 250-hp., 2,300-volt motor as primary drive and a steam engine connected by a clutch to keep the ventilation going in case of power trouble.

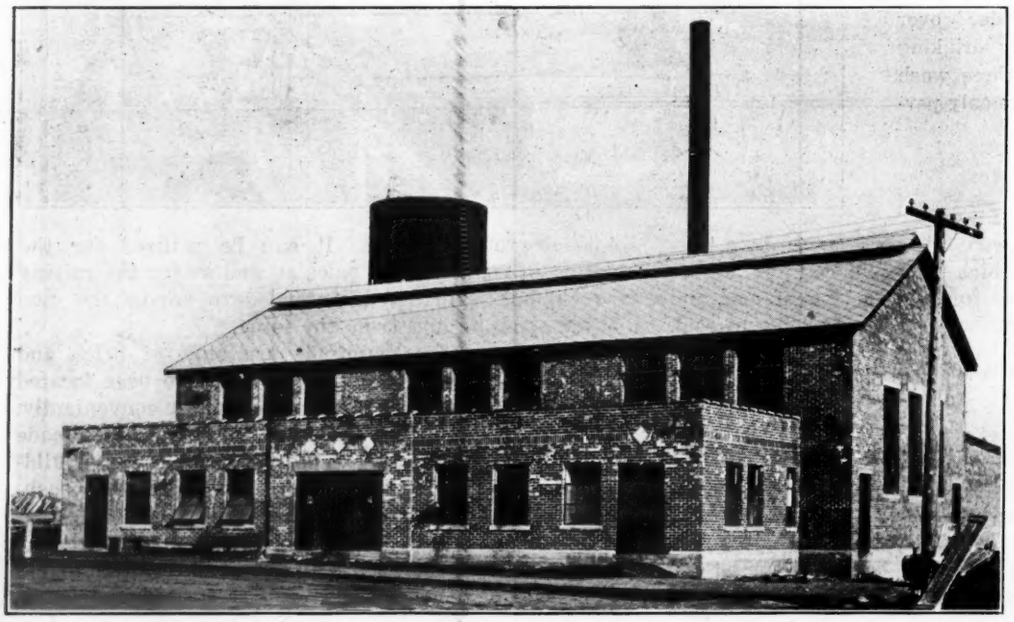
(To Be Continued.)

Governor Does Not Want Troops at Matewan

SENATOR JOSEPH I. FRANCE, of Maryland, having introduced in the Senate on Friday, June 4, a resolution calling upon the President to consider the advisability of sending Federal troops into West Virginia "to suppress domestic violence and prevent civil conflict," Governor John J. Cornwell, of West Virginia, in a telegram told Senator France that his impudence was exceeded only by his ignorance of the Federal Constitution.

At the same time that the Maryland Senator introduced his resolution he asked that it be allowed to lie on the table so that he could call it up for the purpose of making a speech on what he termed were the conditions existing in West Virginia. Data for the speech he was to deliver were furnished, it is charged, by the United Mine Workers.

Following the trouble at Matewan, W. Va., the United Mine Workers called upon the War Department and the Department of Justice to interfere. When the miners were told that no report of a dangerous situation had been received and that troops could not be sent into West Virginia unless the Governor of the State requested it, representatives of the miners became highly incensed at the Department of Justice.

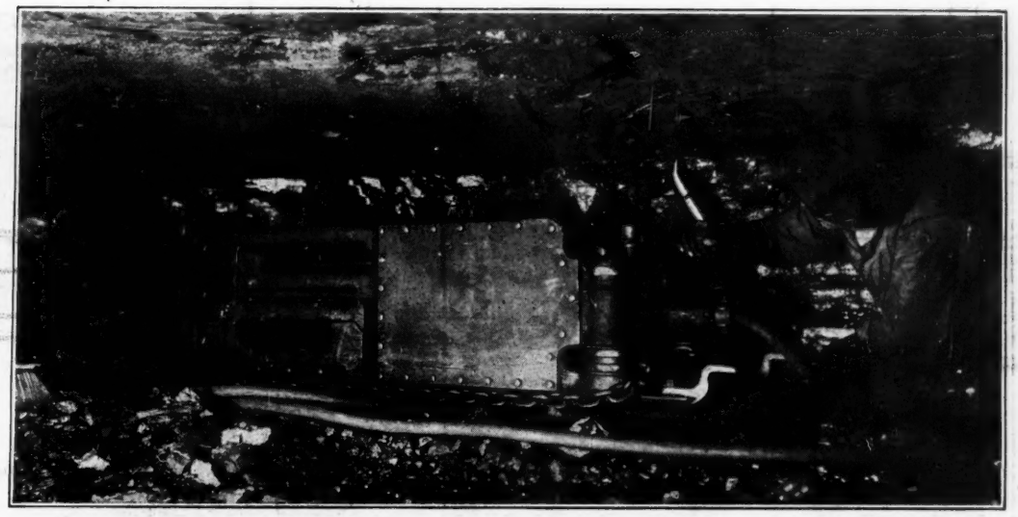


Washhouse

This building contains two shower rooms each with twenty shower baths, hooks for 600 men, a foreman's office, a lamp-charging and first-aid station. Illinois has a number of excellently-appointed bathhouses. In that state the mine workers nearly all bathe and dress before they leave the plant.

A Tight Place

If we could get shoveling machines into the narrow passages and low head room into which we can get our undercutting machines, a larger field would be opened for their operation, especially in the British Isles, where this picture was taken.



Economy and Safety Are Secured by Use of Alternating-Current Coal Cutters

Savings in Equipment Cost, in Power Expense and in Maintenance Charges as Well as Greater Safety Accrue from the Use of Alternating Instead of Direct Current for Driving Undercutters

By Charles B. Officer
Chicago, Ill.

ALTERNATING-CURRENT motors were first applied to continuous coal cutters in America during the fall of 1912. At that time a Sullivan continuous-cutting chain machine fitted with an induction motor was put into operation by the Star Mining Co. at Rugby, Col. Shortly afterward a second machine identical with the first was started by the Gordon Fuel Co. at Walsenburg, Col. These machines differed from the standard "CE-7" equipment in that an induction motor with suitable starting apparatus replaced the direct-current motor with its starting mechanism. The induction motor and the direct-current machine it replaced were of the same rated horsepower.

CONNECTION TO FEED LINES IS READILY MADE BY DROPPING THREE HOOKS OVER THE THREE CONDUCTORS

It is just as easy to connect up the cable with alternating current as with direct, except for the fact that there are three contacts to be made instead of two.

From the start the operation of these machines was closely watched. It soon became evident that the application of alternating electric current to coal-cutting equipment was, and would be, successful and economical. Since that time there has been a constant increase in the number of mines which use this form of energy for the operation of cutting machines.

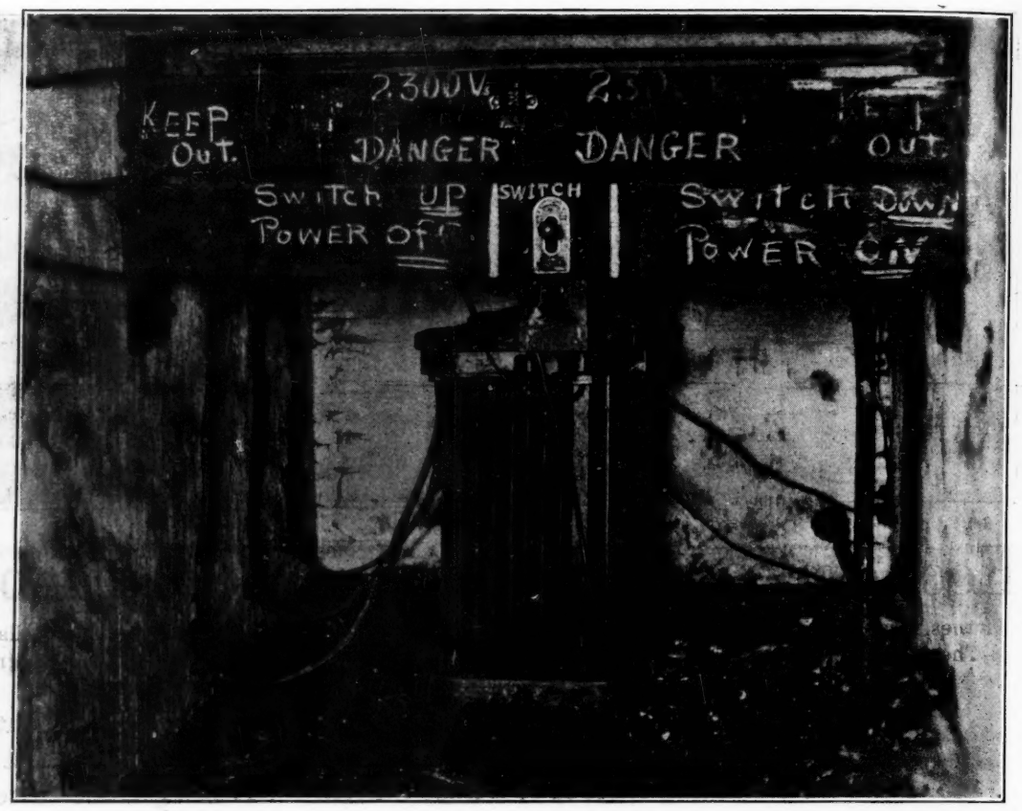
Why Alternating Current Is Favored

The largest single installation employing alternating current underground is at the mines of the Nokomis Coal Co. at Nokomis, Ill. Here thirty-two Sullivan "Ironclad" machines are being operated with 220-volt 3-phase 60-cycle current. The Nokomis Coal Co. was the first in the State of Illinois to use continuous coal cutters equipped with alternating-current motors. It began the operation of these machines in 1913. Since that date the proportion of coal mined in Illinois with alternating-current equipment has increased till now about one-fifth of the coal produced by machines is cut by such equipment.

While there probably are more alternating-current coal cutters in use in the Central and Western States than in the East and South, the satisfaction that the alternating-current machines are giving is leading to their adoption in these older fields in constantly increasing numbers. In foreign lands also alternating-current

An Unpretentious Device

A motor-generator set would make a handsomer illustration, but with alternating-current it is not required. A transformer sunk into the wall of the entry is all that is necessary for stepping down the current. It does its work without an attendant, and does it well. Being so simple, it is inexpensive in first cost, operation and maintenance, readily portable, space saving and in every way desirable.



cutters are increasing in popularity both in longwall and in room-and-pillar mines.

From the above some idea can be gained of the increase in the use of alternating current. The causes that underlie the preference for that form of electric energy are briefly: (1) Saving in initial equipment, (2) saving in operating power charges, (3) greater safety in operation, (4) saving in maintenance expense.

The saving made in the initial equipment cost is the result of the difference between the electrical characteristics of alternating and direct current. It is a known fact that in a 3-phase alternating-current system only 75 per cent of the total weight of copper is required for the circuit that is needed for the installation of a direct-current line of the same voltage and line losses. When the amount of underground wiring necessary for a cutting machine is considered the saving in copper cost alone is an important factor. As it is considered good practice in many localities to run a feed line and use a bonded-rail return where direct current is employed, the statement above should be corrected somewhat, for the figures covering necessary copper refer to a two-wire direct-current circuit.

Excess Copper Used to Offset Rail Return

However, it does not follow that where a bonded-rail return is used a direct-current circuit of this type employs only one-half the copper necessary for a two-wire circuit of the same capacity. The reason for this is that in order to incur only the same power-transmission losses in the circuits it is necessary to install a much larger feed line on the single-wire circuit than is necessary if two wires are used.

This compensates for the larger losses of power in the return side of the circuit, which is composed of bonded rails having a much higher resistance than an all-copper return. It has been found in actual mine practice that a 3-phase alternating-current circuit of the same voltage requires from 5 to 10 per cent less copper than a single-wire direct-current circuit having the same power-transmission losses.

It has been argued in favor of the direct-current installation that in all coal mines some form of haulage system is necessary; up to the present no suitable alternating-current mine locomotive has been designed and it is consequently necessary to use direct current for this purpose. Trolley lines for the haulage system therefore must be installed. Since these lines are necessary, mining machines can be operated from them and it would seem that it would be merely a duplication of expense to install the series of wires necessary for carrying alternating current to the machines.

Lines for Locomotives and for Cutters

This viewpoint is contrary to the best mine practice of today. It has been found by experience that with a mine equipped with direct current only, greater economy has been secured where power lines have been installed for the mining machines independent of those for the haulage motors. The reason for this is that when locomotives and mining machines are on the same power lines the former may draw so much current that the voltage maintained on the mining machine is fluctuating and often low, so that the undercutter slows down and stalls, with resultant loss in coal output. This loss in output more than counterbalances the added cost of a separate power line for the cutting machines.

Not only is the above loss in coal output incurred through having two classes of machines on the same power lines but it has been found also that because of fluctuating voltage the repairs to the cutting machines are increased. This means further loss of production. From the above, the desirability of using independent circuits for haulage and cutting is apparent.

There is, moreover, an additional saving to be made with alternating current. This arises from the fact that by its use it is possible to carry energy at high potential, with a corresponding saving in copper, close up to the point of application and there transform it to a lower voltage suitable for the machines installed.

Can Bring High Tension Near Working Face

This latter economy can be secured in either of two ways—the high-tension current can be carried underground and stepped down to a voltage suitable for the machines at transformer stations, placed within 500 to 1,500 ft. of the face, or the transformer stations may be placed on the surface and low-tension conductors dropped through boreholes to the working face.

In this latter case the transformer stations above ground should be moved forward from time to time as the face advances. In most installations the transformers will be so proportioned as to reduce the voltage to between one-fifth and one-tenth of its original value. Since the weight of copper required for a circuit is inversely proportional to the voltage carried, the saving that can be made in copper expense by the use of these transformers is at once evident.

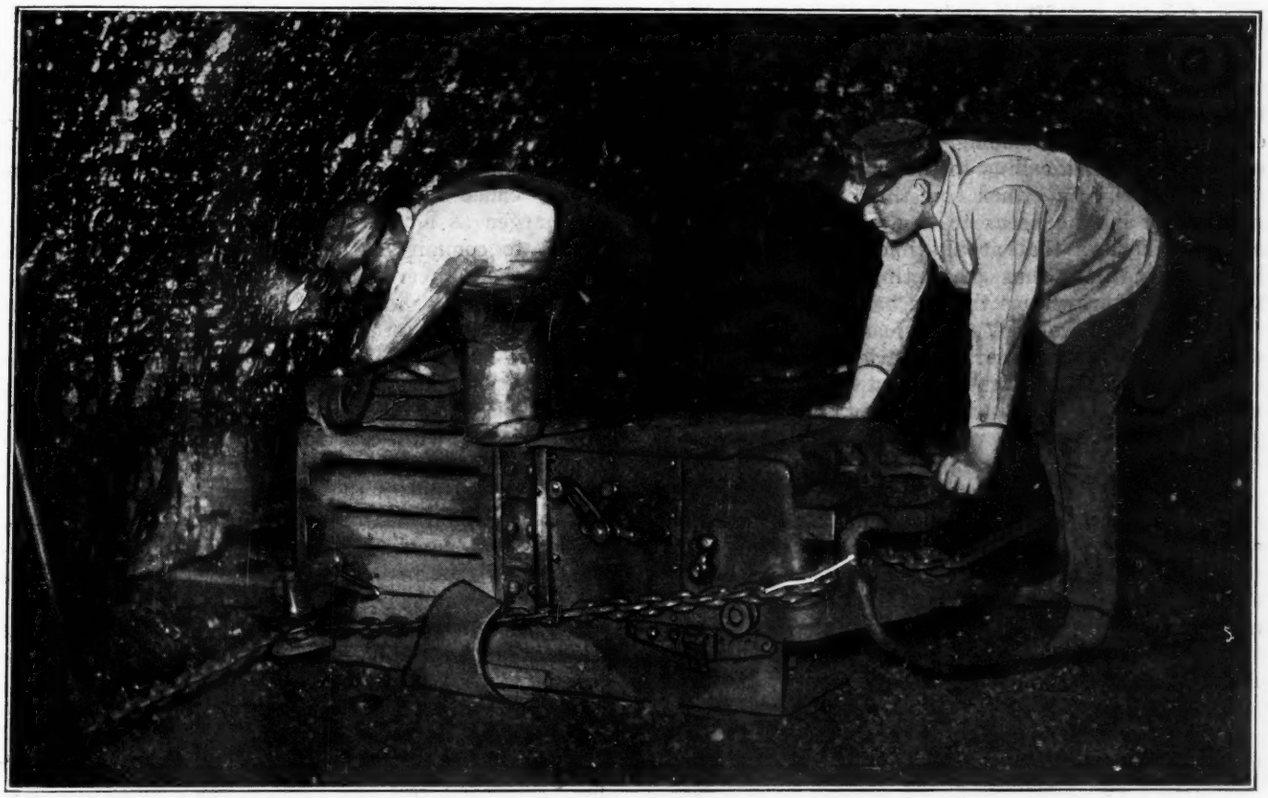
The second main reason for the growing preference for alternating-current mining machines lies in the cost of producing power. A saving may be made here through the installation of a central power plant for several mines or by the purchase of power from a central generating station. In a large power plant economies of operation can be realized which are impossible with smaller operations. The nature and method of securing these savings have been reviewed so many times at length in the various technical journals that no necessity exists for going into details regarding them.

The ease with which alternating current can be transmitted long distances and transformed with only slight losses renders possible still further savings. A direct-current plant does not lend itself to easy and efficient transformation of voltage and precludes long transmission at high potential. Moreover, the use of direct current necessitates a substation with rotary converters, or motor-generator sets, which always require attendance, whereas with an alternating-current installation the transformer requires no attention.

The third consideration favoring alternating current as against direct is the greater safety attained in operation. In comparing the safety of a direct- with an alternating-current circuit it is necessary to remember that in all parts of the direct-current system there is always a difference in potential between the line and the ground equal to the voltage carried. Should anybody come in contact with the feed line or any part of a live direct-current circuit, he would be subject to a shock from a current of this potential.

Proper Grounding Reduces Shock Liability

On alternating-current installations when the secondary side of the circuit is not grounded it is necessary for a person to come into contact with two out of three wires in any part of the circuit before he would receive a shock. He would then receive the same voltage that he would from a direct-current system. Where alternating-current systems are properly grounded there exits between either of the live wires and the ground a difference in potential equal to approximately one-half the voltage of the full line circuit. This cuts down by 50 per cent the shock which can be received by making



USING A SHORTWALL ALTERNATING-CURRENT COAL CUTTER IN A THICK SEAM

Note the cable in the rear of the machine by which three conductors without any complication bring the electric energy to the induction motor. The connections are quite simple and readily made. The mine in which the photograph for this illustration was taken is located at Nokomis, Ill.

contact with this wire and the ground. Moreover, when alternating current is used it is possible to carry the wire through air courses or passageways seldom frequented by the men.

With an alternating-current circuit also, since the size of each wire is considerably less than that required on a direct-current circuit and it is possible to employ insulated conductors, it is the general practice to install insulated cables. This secures a still greater degree of safety and favors alternating-current.

The fourth item tending to make an alternating-current installation preferable to one employing direct current lies in the saving made in maintenance expense. As far as the mechanical end of the cutting machines is concerned, the cutter bar, feding mechanism and gearing are identical with those employed in the direct-current machines.

The difference in construction consists merely in replacing a direct-current motor with one utilizing alternating current. The alternating-current motor lacks the commutator, brushes, resistance coils, etc., that a direct-current motor requires. The necessary repairs and renewals on such parts are therefore eliminated. In fact, a well-designed induction motor is extremely simple and durable.

Overloaded, the A.-C. Cutter Will Stall

The operating characteristics of an induction motor (in comparison with those of a direct-current machine) are such that less severe stresses are thrown by it upon the mechanical parts of the undercutter. With a direct-current motor should the voltage fall any considerable amount, or should the operator of the machine be careless and run the cutter with full bits the motor will continue to drive th cutting mechanism at reduced speed, putting heavy and excessive stresses on all parts of the device.

When similar conditions arise with an alternating-current installation (that is, either a voltage drop or the existence of a great number of dull bits in the cutter chain), thus placing an excessive load on the motor, it will stall, calling to the runner's attention the fact that there is either something wrong with the voltage or that he needs to reset his cutter bits. It naturally follows that at all times the bits are kept in fair condition, thus preventing excessive stresses from being thrown on the mechanism. It has been found also in operating cutting machines of either the direct- or alternating-current variety that when the runners keep their cutter chains always properly filled with sharp bits, they increase their cutting capacity, with a corresponding increase in the daily coal output.

Low Installation Cost an Advantage

The induction motor is a much more nearly constant-speed machine than is a direct-current motor. When conditions are encountered in mining that put a heavy load upon the undercutter the slight reduction in speed caused thereby gives an increased torque to the motor, thus enabling it to carry the overload up to a certain limit. Once this point is passed, however, the motor stalls.

To sum up, alternating current for driving coal cutters is growing in favor. This is due to its lower initial cost for installation, the saving its use makes possible in operating expense, in power and in maintenance, as well as an increased factor of personal safety which its use renders attainable.

Ed. Snyder Found An Accessory to Murder

THE case of the state against Ed Snyder, charged with complicity in the shooting up of a party of miners at Glen White mines in Raleigh County, West Virginia, in November, 1917, was put on trial in the Circuit Court of Pocahontas County on Friday, June 4, the case having been removed to Pocahontas County from Beckley, Raleigh County. The first day was taken up in hearing the motion of the defendant for continuance, which was overruled by Judge Summers H. Sharp; but little time was taken up in getting a jury.

The opening for the state was made by Captain S. B. Avis, of Charleston, and for the defense by W. G. Barnhart, former U. S. Attorney, also of Charleston. The case grew out of the shooting at a cage full of miners, as they came from their work in the mine at Glen White. A party of men ambushed on the mountainside nearby fired hundreds of shots at them, but no one was hurt. A number of the men implicated have been convicted or have confessed.

The charge against Snyder is that, in the fall of 1917, when the government was requiring that every coal mine produce its limit of coal or be taken over by the Fuel Administration, he planned and furnished the arms and ammunition for the ambuscade, though he was not one of those who actually took part in the shooting.

A strike had been called at the Glen White mine and 50 of the 400 miners employed had quit work, but the mine continued to turn out its full quota of coal. The Fuel Administrator refused to interfere and the strikers then resorted to force and violence, and the bushwhacking party of Nov. 16, 1917, was the result. Snyder was an officer of the local miners' union, which called the strike.

More than a year went by before sufficient evidence could be found to back indictments which were filed in the Criminal Court of Raleigh County at the March term of 1919. Four indictments were returned, eight men being indicted jointly. The defendants elected to be tried separately and Tony L. Stafford was put on trial. A hung jury resulted, but the second trial in January ended in a conviction of the defendant. He was charged as an accessory before the fact with an attempt to commit murder and a felony. Witnesses estimate the number of shots fired at the miners fleeing from the cage to shelter at as high as 300, yet no one was hit. The distance fired was 900 ft., and the bullet holes were numerous in the buildings around the mouth of the mine. The weapons used were Winchesters, Mausers, shotguns and pistols.

One of the witnesses for the state, Mrs. Maggie Lethco, of Lester, who has been under guard, was attacked at a hotel in Bluefield and stabbed in the left side, the assailant making a wound four inches long, but missing vital parts. She was able to go from Bluefield to Marlinton in a car, but collapsed on getting there and is now in a hospital at Bluefield.

The witness had retired for the night, the guards being in an adjoining room. Two men went up the elevator and knocked at her door. When she opened it the attack was made. Two men are under arrest who are believed to be the assailants.

After a seven-day trial Ed. Snyder was convicted by the jury on the first ballot and ordered to serve a five-year term in the penitentiary. The armed miners who drifted into Marlintown when the trial commenced quieted down when the state police arrived.

How the "Grand Push" Determined Present Character of Pennsylvania Coals

Most Geologists Lay Stress on the Geologic Horizon—This Monograph Deals, However, with What Is Perhaps More Important: the Relation of Quality to Geographic Location

BY GEORGE H. ASHLEY*

IF IT was hard for the average doughboy who first saw northern France torn and trampled by war to picture to himself those same regions as they were before the war, how much harder it is for the average man to picture Pennsylvania before the grand shove changed the surface of that great State from a smiling plain to an impassable sea of ridges and that at the same time changed its vast buried swamp deposits, which had been but recently laid down, into many different types of coal!

Let us go back a few years, say 200 odd million—that is the latest and best estimate of the geologists. If that is too much, cut it down to suit suit yourself, only leave a plenty. For a long time, say 75 million years, more or less, a spirit of unrest had been over the land of William Penn. The land lay near sea level, sometimes above, sometimes below. From time to time peace settled over the region, and vast swamps were formed, some of these being scores or hundreds of feet deep. Then the spirit of unrest would set in and the land would sink and be overrun by the sea; at first by the open, salt sea, and later by fresh waters that probably came from some great inland sea lying to the westward. Deposits of mud and sand were carried widespread over the submerged surface, until the filling again reached water level and another vast swamp formed.

This was repeated time and again with all sorts of variations until the district became a graveyard of old swamp deposits which stretched far to the southwestward. At times the land was raised a bit, and running water carried away part of the mud so recently laid down; in places even parts of the marsh deposits themselves were removed. But the general movement was downward, and after each such rise came a sinking and the half-eroded gulleys were soon washed full of sand and the sinking process went on.

But this marshy period was near the close of long ages of sinking, covering hundreds of millions of years, that had been going on through the Appalachian region until the old rock surface had been bowed down in places as much as 40,000 ft. in a long belt where now stand the Appalachian Mountains. During this time the filling in with new rock material had about kept pace with the sinking until the whole mass had been blanketed with the buried swamp deposits.

Then came the grand push! Just what happened or how it happened I shall not attempt to describe, but after such a great accumulation of rock material something was bound to happen. You cannot stretch a rubber indefinitely, nor can the earth's crust sink indefinitely at one place without upsetting the crustal balance. The conditions might be likened to the collapse of a long, low, arch bridge. Not suddenly, though probably with endless earthquakes, the part of the earth eastward from Pennsylvania began a grand push on the part of the earth's crust to the westward. How long the push lasted I do not know, but probably for millions of years.

When the measures over the coal along the line of the Appalachian Mountains were eight miles deep something gave way and the "Grand Push," or pushes, occurred, moving the earth's crust scores of miles, carbonizing coals and distilling shales. Measures near the mountain line folded most and the coal in that region is more completely carbonized.

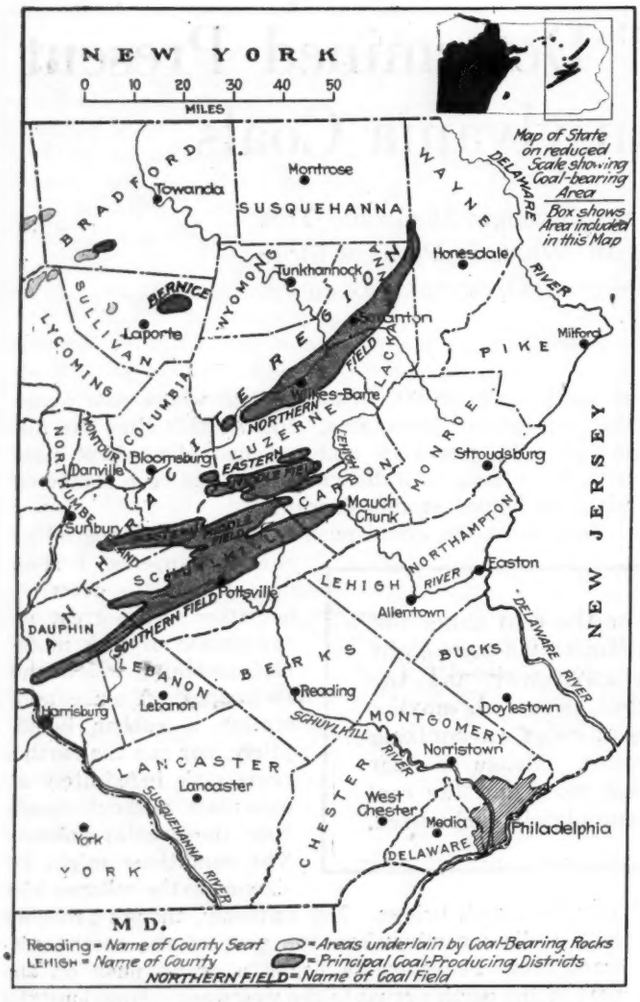
When the push was over what a sight was there! In place of the great wide stretching plain or the shallow sea there was now but a sea of ridges. The whole surface of the earth had been shoved northwestward scores of miles and bent into folds that made ridges that may have dwarfed any of the mountain ranges now to be seen in America. It is possible or probable that the push took so long that the ridge tops were eaten down as they rose, and never became nearly as high as they would have been had the uplift been made suddenly.

The rocks and marsh deposits, the latter now changed to coal beds, were more strongly affected at the east and less strongly at the west. The rocks at the east were, so to speak, in the front-line trenches. In fact, along what is now the Allegheny front, just west of Williamsport, Lock Haven and Altoona, the rocks seem to have made a final stand as if, to carry through the simile, their "backs were to the wall." West of that line the rocks were crowded back on themselves and slightly folded, but in general held their places. This line of holding is nearly straight from Alabama to central Pennsylvania, at which point it turns eastward. The northeastern part of Pennsylvania appears to have formed a hinge or buttress that held in place. Whether the rocks there were more resistant or whether the force of the push had lost its energy, which had been expended further south, I do not know.

Then came a long period of quiet, through what has

*State geologist of Pennsylvania, formerly geologist in charge of coal investigation in Eastern States, U. S. Geological Survey, and one time chairman Coal Classification Board of the same Survey.

The illustrations in this article are taken from one of a series of state maps of the U. S. Geological Survey. There are nine of them and the price is 10c. a piece. The maps are, of course, larger and more detailed, giving not only the coal areas, towns and counties but the villages and railroads also.



COAL FIELDS OF EASTERN PENNSYLVANIA

All the coals mined in this section of the State have some title to be known as anthracites, though in some of them, notably those in the Bernice basin and on the horns of the Southern and Western Middle Fields, which extend west, the coal is a soft anthracite which Mr. Ashley designates as "Bernicite," after the field of that name. Pennsylvania was at one time covered with coal and she might bring action for trover against the other states which apparently have stored away acres of her coal in places unknown.

been called the Age of Reptiles, during which time such great reptiles as are shown in the Carnegie Museum at Pittsburgh, and in all of the other large museums, roamed the earth. During this time the mountain ranges were being eaten down by rain and running water, until Pennsylvania was again a great rolling plain. But in this eating away of the mountains the rocks were carried away by the cubic mile, including a large part of the coal beds laid down there such a short time before. Here and there a little coal escaped, being carried away because it lay in the bottom of a fold that had been folded below the level of the new erosion plain. It was thus that the coal in the anthracite fields, the Bernice and the Broad Top fields, escaped being carried away and remains to this day.

What has become of the rest of the coal? The fixed carbon and the volatile matter returned to the air, and the ash washed down the rivers. When Washington marched to Fort Pitt, Pittsburgh, the Pittsburgh and other coal beds of that region were being carried away by rain erosion, but probably none of those coals ever reached the Ohio River in such form as to be recoverable. Coal outcroppings which occur along or across the bed of a creek having a steep profile may be recognized as "float" for a few hundred feet below the outcrop, but seldom more than one-fourth of a mile. It may therefore be put down as fairly certain that this coal removed long ago has not been accumulating somewhere waiting for someone to come to dig it up.

After the upfolded ridges had been eroded nearly to a plain, over which rivers flowed southeastward to the sea, there came a broad movement of uplift centering in the Appalachian region. As the land rose the rivers became more active, and continued to eat their way downward, chiseling their old channels across the hard layers which now form the ridges, while side branches of the main rivers cut out the softer layers, until central Pennsylvania became again a sea of flat-topped ridges of hard sandstone, separated by wide valleys where the rocks were shales of limestone, until the surface became as it is today.

Black Shale Lost Much Bituminous Matter

But the grand push did more than fold the rocks. In the process of folding the rocks were compressed and fractured, and possibly or probably were heated to some degree, the final effect of which was to drive out of the black shales their bituminous matter, as if it had been distilled out, and to drive out of the half consolidated marsh deposits more or less of volatile matter or gas, at the same time helping to consolidate it into coal. As with the folding, the effect was most pronounced at the east and decreased westwardly.

In the region where the anthracite is now found nearly all of the volatile matter in the coal was driven off, and the coal was compressed until almost as hard as a rock leaving the "hard anthracite." At the western end of the Southern and Western Middle fields and in the Bernice field the action was less severe and a little of the volatile matter remained in the coal which was not so hardened by compression, giving us our "soft anthracite" or "Berncite" (as I have recently suggested calling this type of coal) in which the fuel ratio, that is, fixed carbon divided by volatile matter, is between 7 and 10. Further west the coal was affected still less. In southern Cambria County, most of Somerset County and in the Broad Top field from 15 to 20 per cent of the volatile matter remained in the coal. Most of the coals of the Johnstown, South Fork, Somerset and Meyersdale fields, as shown on Map No. 2, are of this type. This coal is of the same type as the Pocahontas coal, and has therefore been called Pocahontite, as Pocahontas coal has been shipped and is known the world over.

The coal of the northwestern part of Cambria County, in the Moshannon and Snow Shoe fields, and most of that in Tioga and Bradford counties is of the next type, in which there is left from 20 to 25 per cent of volatile matter. This type has been called "Sewellite," from the type of coal found in the Sewell bed of the New River district of West Virginia. The fuel ratio of this type is from 2.5 to 3.5.

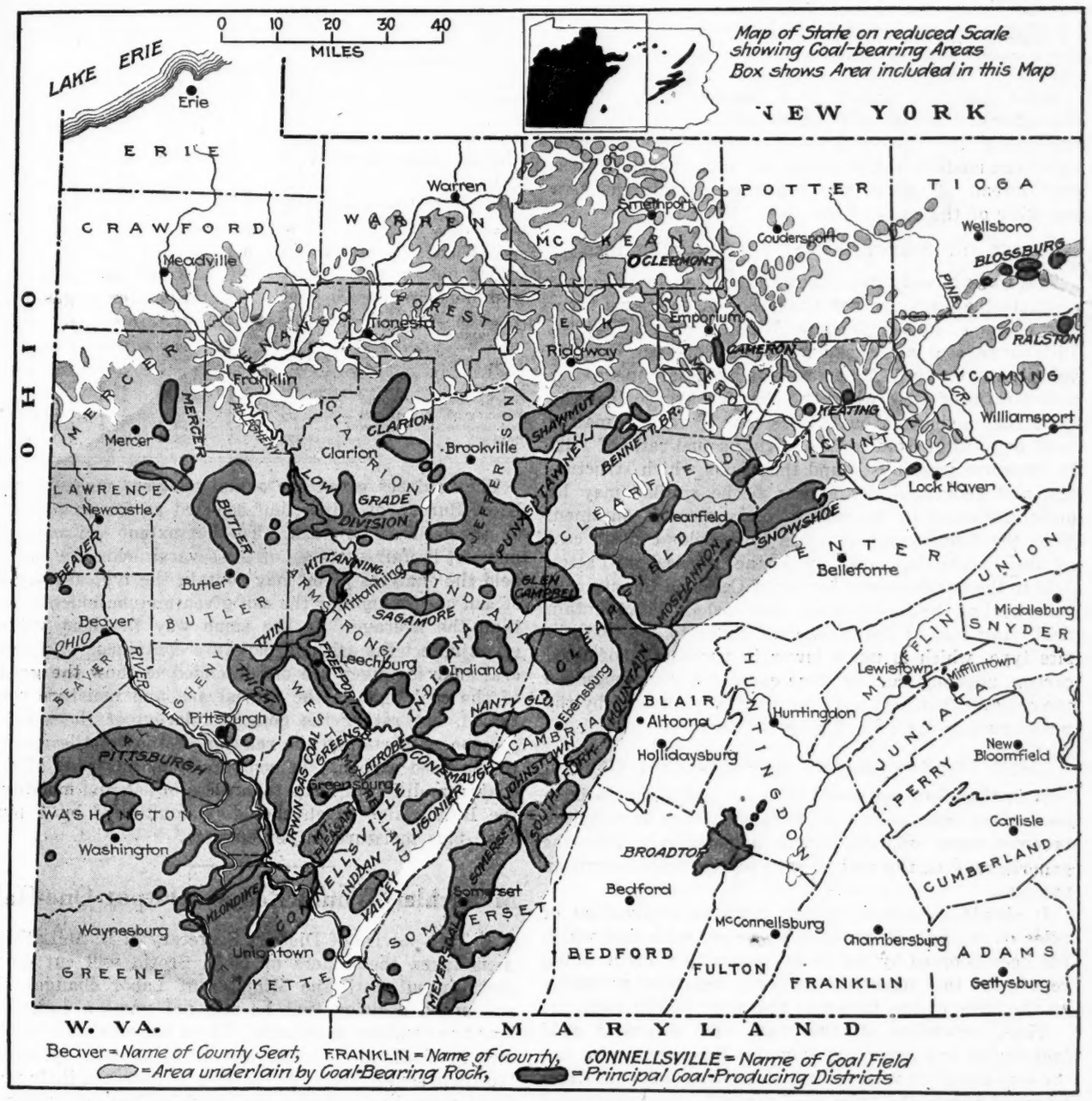
Going still further west the effects of the grand push were less pronounced and there was left about half as much volatile matter (by weight) as of fixed carbon, the fuel ratio being about 2 or from 1.85 to 2.5. This includes the famous Connellsville coking coal, from which the type has been named "Connellsite." It includes also most of the coals in the same belt to the northeastward, including the coal in the Latrobe basin, western Indiana County and the Punxsutawney field.

West of the belt just indicated is found the typical

Pittsburgh gas and steam coal, to which the name "Pittsite" has been applied. This coal differs markedly in its physical character from the coals further east. It is a strong coal, mining and shipping in large blocks or cubes, these blocks being the result of vertical joints in the coal combined with bedding plains. Further to the east the vertical joints became more pronounced and nearer one another until in Clearfield, Cambria and Somerset counties the coal is all split up, with such close-set vertical joints that it tends to mine in long blocks or "sticks," the long side of the blocks lying vertically in the bed. These joints are the result of the pressure to which the coal has been subjected. Pittsite has a fuel ratio of from 1.4 to 1.85.

In the coals of the northwestern part of the State, including the Beaver, the Mercer-Butler, and the coal fields in the adjoining counties, a still higher percentage of volatile matter is carried, commonly from 35 to 40 per cent. That part of the state was less affected by the grand push. This type, which has been called "Belmontite" (from Belmont County, Ohio) has a fuel ratio of less than 1.4 and usually has more than 35 per cent of volatile matter.

As just described, there appear to be seven types of



COAL FIELDS OF WESTERN PENNSYLVANIA AS THEY ARE POPULARLY KNOWN AND DESIGNATED

In the right-hand corner are a number of counties without any coal whatsoever, though a remarkable exception is the Broad Top field in Huntingdon, Bedford and Fulton counties. The coal area with this exception appears to fall within a rude quadrant with the lower right-hand corner of the map, near Gettysburg, as approximate center. Along that quadrant the coal has a semi-bituminous character and as the geologist travels further away from Gettysburg, reaching points toward the west and northwest, the coal gets more and more truly bituminous, getting richer in bitumen as each anticline is crossed. The folds, which near the quadrant are quite stiffly marked, become less and less deep as points to the northwest are reached. It is not safe to try to regard location and structure as the final test of the volatile content in the coal. Some other influences, which science may yet satisfactorily explain, appear to exist, forming a problem which demands solution. As we leave the quadrant and go northwest the needlelike coals of the Moshannon Valley give way to the blocky coals of the Pittsburgh, Freeport, Kittanning and Low-Grade Division coal areas, showing that the "Grand Push" affected the quality of coal not only in volatile content but in structure also, and some have contended in pyrite also, though Mr. Ashley does not deal with this feature.

coal in Pennsylvania, with possibly an eighth type barely recognized in recent analyses. These are as follows, the fuel ratio being the basis for the classification:

TYPES OF COAL IN PENNSYLVANIA

Type Letter	Type	Fuel Ratio	B.t.u.	"Standard Analyses" Moisture	Volatile Matter	Fixed Carbon	Ash
A	Anthracite "Hard Anthracite"	10.	13,850–13,250	3	5	86	6
B	Bernicite "Soft Anthracite"	10.0–7.0	14,000–13,650	3	9	82	6
*C	Brushymontite	7.0–5.0	14,600–12,000	3	13	78	6
D	Pocahontite	5.0–3.5	14,850–14,250	3	17	74	6
E	Sewellite	3.5–2.5	14,650–14,000	3	22	69	6
F	Connellsite	2.5–1.5	14,350–13,750	3	27	64	6
G	Pittsite	1.85–1.4	14,250–13,700	3	33	58	6
H	Belmontite	over 1.4	13,750–13,000	3	40	51	6

*Not represented in Pennsylvania except by a very few samples, especially from the Broad Top fields.

Space does not permit of a detailed study of the character of the coal of Pennsylvania, nor are the data available at this time sufficient for such a study. Plans have been made by the State Survey in co-operation with the Bureau of Mines for starting a comprehensive sampling of the coals of the state.

Place and Structure Not the Only Factors

The work already done shows that even in the same districts the coals are not altogether of the same type. For example, in southeastern Washington County the Pittsburgh coal at Marianna shows 34.6 per cent of volatile matter to 57.7 per cent of fixed carbon, giving a fuel ratio of 1.66, while the Waynesburg coal of the same region shows about 33 per cent of volatile matter to 47 per cent of fixed carbon, giving a fuel ratio of 1.42. In the same way it is found that fields which structurally and geographically appear to be similar may be quite dissimilar in the type of coals therein contained. Thus the Johnstown and South Fork fields contain coal of the Pocahontas type, while the Barnesboro-Patton field in the northwestern corner of Cambria County contains coal of the Sewell type. But coal in the Mountain field lying east of the last-named tends to the Connellsite type, which is much lower in percentage of fixed carbon, showing that by some cause not yet recognized the coals in that field were not as deeply affected by the grand push as the coals further to the west.

Show Commercial, Not Scientific, Groupings

It is therefore not possible to designate the coals in each of the fields as of a single rank, though as sampling becomes more complete it will be possible to give the general rank of the coal in each of the fields shown on the map.

It should be added further that the designation of fields on the map is not quite in accord with that which has been adopted by the State Survey in a forthcoming report. In that report the fields are separated primarily on the basis of the rank and character of the coal.

Thus, according to the map, the Clearfield field includes in one basin not only the Moshannon coal but the coal along the west branch of the Susquehanna River where it passes the town of Clearfield. As a matter of fact, the two areas are distinctly separated by the Laurel Hill anticline and the coal of the Moshannon field has a much larger percentage of fixed carbon than that around Clearfield town and further up the river.

In the same way, the South Fork and Johnstown districts are separated by the Viaduct anticline and not as shown in the map. Practically all of the fields shown on the map as having a long northwestern-southeastern diameter contain a different rank of coal at the southeast from that found at the northwest. The grouping of the fields on the map shows rather a grouping of mines with reference to transportation than with reference to the character of the coal.

SELECTED TYPICAL ANALYSES OF PENNSYLVANIA COALS
(Analyses by U. S. Bureau of Mines)

Fields (as per map)	B.t.u. (As rec'd.)	Moisture	Volatile matter	Fixed Carbon	Ash	Type of Coal
Northern Anthracite	13,830	2.2	5.7	86.2	5.9	A
Southern Anthracite	13,300	2.8	1.2	88.2	7.8	A
Bernice	13,380	3.1	8.5	78.0	10.1	B
Blossburg	13,810	1.7	21.5	67.6	9.2	E
Snowshoe	13,862	3.5	22.1	66.6	7.8	E
Moshannon	14,150	3.1	21.0	69.0	6.2	E
Mountain	14,072	1.1	25.6	64.4	8.2	E
Barnesboro-Patton	14,175	3.0	22.5	67.9	6.4	E
Nanty Glo	14,620	1.2	20.5	72.1	6.0	D
Johnstown	14,081	2.0	14.4	75.3	8.1	D
South Fork	14,278	3.5	17.3	73.2	5.8	D
Broad Top	14,414	2.4	18.2	73.4	6.2	D
Somerset	14,170	3.0	15.5	74.5	6.8	D
Meyersdale	14,290	2.7	19.3	71.2	6.6	D
Ligonier	13,370	3.3	23.0	62.5	11.2	E
Conemaugh (eastern part)	13,820	2.5	17.9	70.4	9.2	D
Clearfield (western part)	14,000	4.1	23.0	66.8	6.1	E
Connellsville	13,990	2.8	30.0	60.0	7.2	F
Indiana	14,310	1.3	26.7	64.4	7.6	F
Glen Campbell	14,054	3.4	23.1	67.2	6.3	F
Punxsutawney	14,300	2.5	27.8	64.0	5.7	F
Bennett Br.	14,020	2.7	32.4	58.6	6.3	G
Shawmut	13,280	2.9	34.7	52.8	9.6	G
Klondike	13,270	4.2	32.3	54.0	9.5	G
Greensburg	13,610	2.7	30.3	57.8	9.2	F
Irwin	14,150	2.0	33.6	58.1	6.3	G
Freeport	13,100	2.7	35.7	50.9	10.7	G
Sagamore	13,510	1.0	34.1	54.1	10.8	G
Pittsburgh	14,000	2.6	34.9	56.3	6.2	G
"Thick Vein" Freeport	13,940	1.2	35.9	55.4	7.5	G
Kittanning	13,310	1.4	36.2	52.5	9.9	G
Low-Grade Division	.....	3.3	33.8	56.8	6.1	G
Clarion	.....	4.8	37.9	50.3	7.0	H
Greene County (western)	.....	2.8	36.0	48.4	12.8	H
Washington Co. (central)	.....	1.4	37.1	53.8	7.7	G
Washington Co. (northern)	.....	2.2	39.2	52.6	6.0	H
Beaver	13,770	2.5	38.0	54.5	5.0	G

The analyses given are actual analyses made by the U. S. Bureau of Mines, but selected as far as possible on the basis of low ash. To that extent the analyses may not be fair averages of the several fields, for in one field the analyses given may contain the typical amount of ash and in another the ash given may be much lower than the average. In the same way the heat values given reflect the ash and moisture contained. The several analyses given are not intended to show the grade of the coal, that is the typical ash and moisture contained, but rather the general relation of the several component parts and the relation of the volatile matter to the fixed carbon. To compare the heat value of the coal from different fields regardless of ash and moisture, the B.t.u. value given should be multiplied by 1 plus (ash plus moisture in percentage).

McLachlan Would Reduce Output One-Half

IF THE advice of District Secretary J. B. McLachlan is taken the miners of Nova Scotia will cut down their output until the Minister of Labor changes his announced decision that he will not name a collective board to consider grievances. In an informal talk to the men he declared that one way to bring coal operators "to their senses" was for the men to decrease their production one-half and thus strike while they are working. The mine workers present took no action on receiving the suggestion.

The mine workers want $1 a day more for all day workers, a 24c. raise in tonnage, and a 25-per cent increase on all deadwork such as timbering, etc. The wage-scale committee will go to Halifax and discuss grievances with the McKinnon conciliation board.

Matters That Must Not Be Overlooked If Mining Machines Are to Do Their Best

Bits Must Be Sharp and Have Clearance at the Back—This Will Preserve the Motor as Well as Save Power—Chains Should Be Reasonably Tight—When One Gear Is Renewed Its Fellow Gear May Well Be Renewed Also

By F. E. Van Slyke*

TO INSURE economy and success in the operation of mining machines, provision must be made for a number of details. Unless particular attention is given to them it is difficult to secure entire satisfaction. First and most important of these is the care of the bits, chain and cutter arm. The bits should always be sharp, even if this necessitates frequent changing. The loss of time incurred in putting sharp cutters in place is not nearly so serious as the increased stresses put on the machine when operating with dull bits. Not only do dull bits cause excessive stresses but they sometimes overload the motor as much as 100 per cent, and the wear on all parts is much increased. The only way to insure sharp bits is to keep an adequate supply on hand, taking them from place to place with the machine. It is also highly important that the bits be so shaped that they will have sufficient clearance at the back, for a parallel-sided bit materially increases the consumption of power. The forms sent with the machine show the correct shape, and the bits should occasionally be checked up with these so that the mechanical engineer, or whoever may perform his function, may feel assured that they are being made correctly. The back part of the bit should be at least $\frac{1}{8}$ in. less in width than the front.

Sharp bits with proper clearance, the right shape of link in the right place, a chain tight but not too tight, gears that mesh smoothly without excessive wear, rubbing surfaces not unduly worn are necessities if satisfactory results are to be obtained. The bits must cut and not rub their way through the coal.

Set Bits to Clear Cutter Arm and Links

The bits should be so set that they extend the proper distance out from the chain in order to insure clearance for the cutter arm and the links. All set screws should be kept absolutely tight. Dull bits with inadequate clearance at the back and so set as to afford insufficient space for the cutter arm in the kerf are a prolific source of trouble on coal-cutting machines of all kinds. It is therefore highly important that such conditions be avoided.

The chain should be kept moderately tight, but not so tight as to bind. In the first few hours of running, the chain on new machines sometimes gets quite slack, a fault which may be overlooked. The slackness arises from slight irregularities in the holes in the chain which become smooth as soon as the machine is put into operation. The smoothing down of even 0.001 in. on a large number of links will add an appreciable length to the chain. Therefore the chain tension on new machines should be watched carefully.

The chain should be tightened up as far as it will go, and then slacked off about one turn of the adjusting screw. If the operator gives this matter careful attention he can soon arrive at the proper chain tension by observing how it acts under different conditions. It takes a little time to note the operation and experiment a little with various tensions. Such trials are well worth the trouble they entail. The hardened strips and wearing parts of the cutter arm should be renewed as soon as the center line of the chain gets out of true with the center of the cutter bar. When this occurs it causes a reduction in the width of the kerf and makes the cutter arm bind. This condition is easily detected by trying to lift the chain when it is not running. If it can be raised from $\frac{1}{4}$ to $\frac{3}{8}$ in. the parts should be immediately renewed. It will be observed that the proper width of the kerf is entirely dependent upon the chain being held in a central position.

In replacing broken links always be certain that the new part gives the same bit position as that of the one taken out. In many cases machine runners put in a new link without paying any attention to this consideration and in a short time a number of the positions in the chain are entirely eliminated, so that the machine is not cutting uniformly across the full kerf width. This leaves portions of coal which are broken out by the chain links instead of by the bits, causing increased power consumption and wear and tear on all parts.

Another serious matter in connection with the operation of undercutters, which in a good many cases is not looked after properly, is the renewal of gearing. Gears are sometimes replaced without renewing the pinions, or pinions are replaced without renewing the gears. This is bad practice, since a worn gear or a worn pinion never operates satisfactorily with a new part. Unless one of the members is practically new it should never be left in place when renewing the member meshing with it. This is most serious with worn gears, for when one is badly worn it tends to destroy the other rapidly.

When renewing bearings all the bearings for a train of gears should be replaced at one time in order to insure correct gear meshing. It is of little advantage to replace the bearings on a shaft when the shaft carrying the meshing gear is running in a worn journal.

Another detail that cannot be brought out too strongly is the necessity of keeping accumulations of dirt out of the motor and gearing.

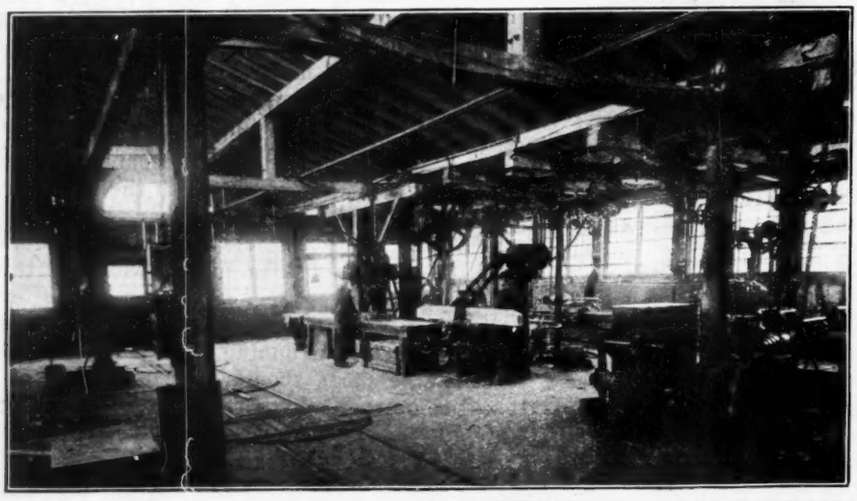
*Jeffrey Manufacturing Co., Columbus, Ohio.

Mine Shops at Kingston Build Storage-Battery Locomotives for Colliery

Small Work Segregated from Large Work to Prevent Misappropriation of Property—Work on Locomotives Maintains Working Force During Slack Summer Period, thus Maintaining Morale of Men

BY DEVER C. ASHMEAD
Tarrytown, N. Y.

BECAUSE of their arrangement and the completeness of their equipment as well as the volume and quality of work they turn out, the shops of the Kingston Coal Co., at Kingston, Pa., are worthy of more than casual attention. These shops comprise two buildings. Of these the larger houses the machine, carpenter, car-repair and blacksmithing departments, while the smaller serves as the electrical repair shop.



Machine and Carpenter Shop

Part of the Kingston Coal Co.'s shop where cars are repaired by machinists, carpenters and blacksmiths and where in spare time new equipment is constructed.

Electrical Repair Shop

Here armatures are rewound and other repairs made without the delays incident to the shipment of parts to distant machine shops.

Both the buildings are constructed of brick and have concrete floors, but that the electrical building is of later construction than the other can be readily seen by comparing the two illustrations showing the interior of the shops. The roof of the electric shop is supported by steel trusses and I-beams, whereas in the older building the roof trusses are of wood.

Well lighted during the day by numerous windows and at night by large incandescent lamps, these shops are desirable working places. Tracks for handling such mining equipment as is in need of repair extend into the buildings. In the machine shop turntables are so placed and the tracks so arranged that all parts of the shop are easily accessible. In Fig. 1 the carpenter shop is in the immediate foreground. To the rear may be seen the machine shop, the photograph being taken from the blacksmith shop. The foundation of the steam hammer can be seen in the lower right-hand corner of the illustration.

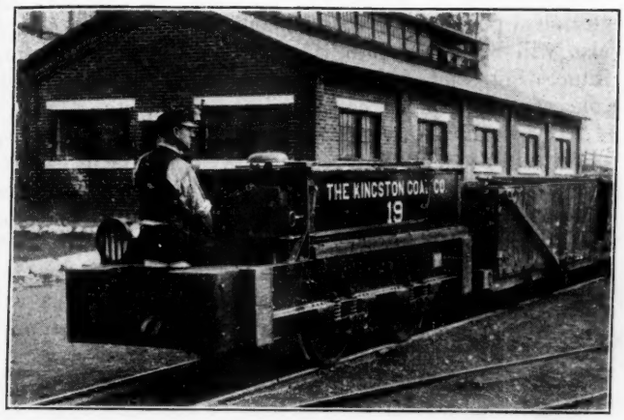
The equipment of the shops is fairly complete and practically any kind of repair work can be done except the making of castings. The machine shop is equipped with a 24 x 84-in. planer, an 18 x 30-in. shaper, a 22-in. swing lathe, an emery grinder, a 24-in. Barnes drill press, a 1½-in. bolt cutter and a 10-in. Cox pipe machine. The carpenter shop has a 24-in. Greenlee cut-off saw, two Greenlee post drills, a mortising machine, a 24-in. surfacer, a Greenlee rip saw, a Colliday 3-ft. band saw and a wood-turning lathe. The blacksmith shop is provided with a 600-lb. steam hammer, a portable crane and four forges.

The blacksmith shop is divided into two parts. One portion is used exclusively for work done for the mine, while the other is employed for repairing and sharpening the miners' tools. The part devoted to this purpose is fenced off completely from the rest of the building and has a separate entrance from the outside. This arrangement is made in order that there may be no necessity for the miners to pass through any other part of the shop, such passage sometimes meaning a reduction in the company's tool supply. People are to be found everywhere who regard tools as common property

and who think that for safe keeping they should remove them to their own home.

The electrical shop shown in Fig. 2 is well provided with apparatus necessary for the maintenance and repair of electrical equipment. Because of the weight of motors and armatures a traveling crane has been provided to move these parts about the shop.

In shops of this size it is often necessary to maintain a larger force than is ordinarily required, in order to take care of peak demands. Such demands occur more frequently in winter than in the summer because of the more exacting working conditions then encountered. Such a condition means that during parts of the year there is an excess of men in the shop and a lack of work. No coal company desires to lay men off during periods of slack work, for it realizes that when the demand for men returns it will be unable to secure them, as the other companies in the vicinity probably will be in the field at the same time. A slack-work period must, however, be met. If the company cannot afford to discharge or lay off its men, it must provide some way of using them, for men who are not continuously employed lose their morale and as a result become worthless to their employer.



BATTERY LOCOMOTIVE BUILT BY MINING CONCERN

This 5-ton storage-battery locomotive was constructed during slack time at the blacksmith and electric repair shops of the Kingston Coal Co.

During the past few years there has been a great increase in the use of mechanical haulage, particularly in those fields where the use of the storage-battery locomotive is permissible. A demand for this type of machine has arisen that has been far in excess of the supply. This condition contrasts greatly with a time not over five years ago when some companies would not consider such locomotives at all. One firm actually demanded a contract agreeing that the company would be protected against all damage that the storage-battery locomotive might do to the mine.

Conditions in the mines served by these shops were such that storage-battery locomotives could be used satisfactorily, but the company found it almost impossible to secure such machines. Having a surplus of skilled mechanics during part of the year it decided to assemble its own storage-battery locomotives. The assembling of the frames was done in the machine and carpenter shops, while the electrical installation was performed in the electrical shop. Fig. 3 shows one of the storage-battery locomotives thus constructed. These machines are all of 5-ton size and have forty-eight 23-plate cells.

Compensation Results Achieved in Illinois and Pennsylvania*

Mines Insured Show Consistent Improvement of Physical Condition and Safety, with Lowered Premium Cost—Low Accident Rate Reported

BY HERBERT M. WILSON

A TYPICAL mine in central Illinois insured from 1915 to 1919 inclusive, with from 190 to 270 employees and premium earnings from $8,800 in 1916 to $14,800 in 1917 and $21,200 in 1918. These premium increases were due in part to increased number of employees and partly to increase in wage rate. During the same period there was an increase in the number of accidents; in 1916 there were 73 non-fatals, costing over $1,200; 3 fatals and 156 non-fatals in 1917, costing $10,300; 1 fatal and 174 non-fatals in 1918, costing $15,000. The margin of profit on the business was negligible.

The schedule-rating history showed a base rate of $4.50 increased by the first schedule rate to $5.21, which reflects the correspondingly bad safety condition. The next schedule rate showed material improvement, $4.36; the last a still further improvement, $3.86. Within the last year there was correspondingly good experience, which earned a credit of 13c., making the adjusted rate $3.70, as compared with the first, which was $5.21.

A mine in northern Illinois, where the fatal-accident record is good and the base rate correspondingly low, viz., $3.60, had a payroll for the two years 1918-19 averaging 390 men, premium earnings the first year $12,000 with 156 non-fatals and compensation costs of $7,800, giving a slight margin of profit. In 1919 the premium was only $9,600 with a material increase in non-fatals to a total of 257 and corresponding increase in compensation costs of $14,400.

At the same time the first schedule rate was above normal, namely, $3.76; the next $3.06 and three were reported during 1919, respectively, $2.79, $2.38 and $2.34. This operator has nothing to complain of, since for everything he has done to safeguard his mine he has had a reduction in his premium rate and corresponding reduction in his total premium costs at a time when his payroll was mounting on account of wage increases and his losses were also mounting, probably because of a poor moral hazard.

A mine in southern Illinois in the gaseous and fiery district, with about 225 employees, had a premium in 1917 of $13,800 with one fatal and 14 non-fatals and loss costs of $7,300. Premium in 1918 was $11,500; one fatal and 17 non-fatals, with lost costs in excess of premium, namely, $12,100. There was a corresponding change in schedule rating results, viz., first schedule rate $4.47, the next $4.38 and the last $4.11.

I hesitate to give you illustrations from Pennsylvania. They are too numerous, and would but be a monotonous repetition of the above. All show practically the same relative trend as illustrated for Kentucky and Illinois but with greater emphasis because the period of insurance has been longer. There has been on the whole a marked improvement in the physical condition of the mines as reflected by the schedule-rating inspections. Many mines are now given nearly or quite perfect safety scores with a few or no charges.

*At the request of *Coal Age* the general manager of the Associated Companies contributes these typical examples of the workings of the Compensation Act, supplementing his article on "Coal-Mine Compensation in Kentucky," which appeared in a previous number.

Opportunity for Coal Men to Note Mining Methods of a Kindred Industry

A. I. M. E. Will Study Mines of Michigan Copper Country, the Ishpeming, Vulcan, Norway and Iron Mountain Iron Mines and the Strippings of the Mesabi Range — Deep Mines, Difficult Pumping Problems, Immense Strip Pits and Golf Principal Attractions

MINING is still mining, whether in copper, lead, zinc or iron mines, and from any type of mine much may be learned that will serve as suggestions for the operation of mines in the kindred industry of coal mining. Solutions forced on the owners of one type of mining property offer valuable suggestions to operators of another type.

Coal mining engineers will be much interested therefore to learn that the American Institute of Mining and Metallurgical Engineers proposes to make its summer trip to the copper and iron mines of the Great Lakes and to view the works, above and below, of that wonderful mining region.

What the Mesabi region is doing today the anthracite strip-pit mines may be doing tomorrow; the pumping problem of the Athens mine may give a hint to a deep mine in eastern Pennsylvania or northern Ohio; the hoisting problem at a mine 12,500 ft. deep may give a valuable hint to a man whose mine is not a tenth of that depth. All forms of engineering bear on one another but especially does one form of mining engineering contain the kernel of experience and experiment which may better the methods of another.

A limited number of Eastern members will leave Buffalo on Friday morning, Aug. 20, by S. S. Tionesta of the Great Lakes Transit Corporation, picking up other members *en route* and reaching Houghton about noon Monday, Aug. 23.

Hoisting Plant Lifting Mineral 2½ Miles

At Houghton the members probably will take first an automobile trip through the district, seeing in a general way the operations above ground. On Monday evening they probably will have a dance at the yacht club. On Tuesday there will be a visit to the copper mines under ground, a sightseeing and historical trip to Keweenaw, and a trip to see the leaching and milling, the dredging, flotation, smelting and electrolytic refining plant. The members will have an opportunity of seeing mining, descending an inclined shaft that has been sunk with a change in angle under ground. A new hoisting plant to raise mineral from a depth of 12,500 feet will be in operation by the time of the visit. On Tuesday evening there will be further social entertainment and the party will then leave by two special trains, one of which will go to Ishpeming, the other to Vulcan.

At Ishpeming two hours will be spent at the Pioneer Charcoal & Iron Furnace, where not only pig iron and charcoal are made but also many charcoal byproducts, such as wood alcohol, formaldehyde, acetic acid, various acetates, etc. The reinforced-concrete ore-loading dock at Marquette is a model structure of its kind.

After visiting these points lunch will be served at the Wawonowin Golf Club, followed by a visit to the Athens mine, one of the novel features of which is the electrical pumping of water 2,500 feet in one lift. There also will be an opportunity to see at Ishpeming some interesting and architecturally-attractive reinforced-concrete headframes, concrete-lined shaft, etc.

At Vulcan, Norway and Iron Mountain the other party will see some interesting developments in electric hoisting, including safety devices, and other electrical machinery; also some deep pumping with centrifugal pumps, a hydro-electric plant, a concrete-lined shaft, etc., etc. There probably will be a technical session that evening at Iron Mountain, where the trains will be reassembled, and the party will reach Minneapolis early in the morning of Thursday, Aug. 26.

At Minneapolis there will be sightseeing trips for the ladies and technical sessions at the university, followed by a lunch at the Town and Country Club. The afternoon will be devoted to sightseeing, and the evening to a banquet and addresses.

Big Strip-Pit Proposition, 300-Ton Shovels

On Friday, when the Mesabi Range will be visited, the guests will awake at Babbitt, where an inspection will be made of the new mine and of the concentrating and sintering plant of the Mesabi Mining Co. Thence they will go to Virginia to see the 300-ton steam shovels, and from there by automobiles through Mountain Iron, where the Brunt ore-drying plant is located. The party will arrive at Hibbing toward the close of the afternoon. At Hibbing there will be a business and social session, and the party will arrive early in the morning of Saturday at Coleraine, where it will inspect the largest ore-washing plant in the world, thus having seen practically everything in the Mesabi district.

Duluth will be reached about 1 p.m. on Saturday, Aug. 28, and a visit will be made to the Minnesota Steel Co's. plant, with its model village. This company is a subsidiary of the U. S. Steel Corporation. A visit also will on the heights far above the city.

The estimated expenses are in part as follows, meals being extra, except as stated:

Railroad fare on special trains, Houghton to Duluth, about	$45.00
Double lower berth, five days and nights, about	17.00
Upper berth, five days and nights, about	14.00
Compartment for 2 or 3 persons, 5 days and nights, about	50.00
Drawing room for 2 or 3 persons, 5 days and nights, about	60.00
Railroad fare—Chicago to Houghton	13.36
Railroad fare—New York to Chicago	29.42
Railroad fare—Duluth to Chicago	15.21
Railroad fare—New York to Buffalo	14.21
SS. "Tionesta"—Buffalo to Houghton, including berth and meals	39.96
SS. "Juniata"—Duluth to Buffalo, including berth and meals	48.60

For further details regarding expenses see the Institute's circular. Reservations should be made immediately.

Blizard Heads Survey at Pittsburgh —Kreisinger Will Co-operate

Former Official of Canadian Mines Department Will Have Assistance of Predecessor Corporation— Lends Financial Aid for Research Work

THROUGH a co-operative agreement entered into between the U. S. Bureau of Mines and the Combustion Engineering Corporation about a year ago, Henry H. Kreisinger, fuel engineer of the Pittsburgh Station, leaves the Government service and is succeeded by John Blizard, formerly chief fuel engineer of the Department of Mines of Canada. Mr. Kreisinger and Mr. Blizard will co-operate with each other in their new duties, however, and it is understood that reports of research work made by Mr. Kreisinger for the Combustion Engineering Corporation will be submitted to the bureau for publication before being used by the former organization.

The U. S. Bureau of Mines allots its fuel department approximately $32,000 yearly. Out of this sum must be paid the salaries of all of the men in the department, which leaves about $5,000 annually for research work. When these figures are contrasted with $20,000, which has been allotted for the first quarter year of Mr. Kreisinger's work with the Combustion Co., the financial handicap on the Bureau of Mines can be realized.

Mr. Kreisinger was born in the town of Radnice, in what is now known as Czechoslovakia, but at the time of his birth the town constituted a part of Bohemia. He came to America in 1891, at the age of fifteen. In 1900 he entered the University of Illinois and four years later received the degree of Bachelor of Science. Continuing his studies, he graduated as Mechanical Engineer in 1906.

After gaining the latter degree he entered the Technological Branch of the U. S. Geological Survey, which had quarters in the St. Louis Exposition grounds. Here he was assigned to the fuel-testing plant. In 1910, when the Bureau of Mines was created and took over the work being done by the fuel-testing department of the Survey, Mr. Kreisinger severed direct connection with the Government and became fuel engineer for the Clinchfield Fuel Co., of Spartanburg, S. C.

While with the Clinchfield Fuel Co., Mr. Kreisinger was frequently consulted on combustion problems by the bureau. The acquaintances formed and opportunities offered by the Bureau of Mines for research work were so attractive to him, however, that in 1913 he returned as head of the fuel department of the Pittsburgh Station. When the bureau home in Pittsburgh was changed from the old Arsenal Buildings on Butler St. to the new million-dollar buildings in the Oakland district, Mr. Kreisinger was given increased opportunities for the research work of which he is so fond. As a designer of fuel-testing apparatus he has perhaps no peer. The result has been that the fuel-testing laboratories of the Pittsburgh station are the most complete of their kind to be found anywhere.

HENRY H. KREISINGER

JOHN BLIZARD

While connected with the Combustion Engineering Corporation as research engineer, Mr. Kreisinger will make his headquarters at the Bureau of Mines station in Pittsburgh. By this arrangement a closer co-operation between the two institutions will be maintained. The first problem upon which Mr. Kreisinger will center his efforts will be a thorough testing of the powdered-coal plant of the Bureau of Mines at Milwaukee, Wis.

While engaged in this work he will have under his direction four men from the Bureau of Mines fuel-testing laboratories and fifteen others who will be carried on the payroll of the corporation. These men will be chosen from newly-graduated engineers and men who will be seniors in college next year. He will be allowed the full and unrestricted use of any equipment or apparatus owned by the bureau.

Mr. Kreisinger is a member of the Sigma Xi engineering fraternity, the Coal Mining Institute of America, the American Society of Mechanical Engineers and the American Society for the Advancement of Science.

John Blizard, who succeeds Mr. Kreisinger as head of the fuel department of the Bureau of Mines, was born at Wotton under Edge, England, in 1882. He is a graduate of the University of Durham and for several years was connected with the firm of Richardsons-Westgarth, marine and electrical engineers, of Hartlepool, England. He came to Canada in 1906 to lecture on mechanical engineering at McGill University, Quebec. While at the university Mr. Blizard became interested in fuel and combustion research work and spent much time with Professor Durley of that institution seeking a solution of combustion-engineering problems.

In 1911 he assumed charge of the fuel-testing department of the Department of Mines of Canada and comes to the U. S. Bureau of Mines directly from this station. While not so well known to mining men as Mr. Kreisinger, he is equally recognized by prominent combustion engineers.

Discussion by Readers

Edited by
James T. Beard

Flotation Fails to Clean Coal

RECENTLY, my attention was attracted to the brief article under the caption "Can Coal be Cleaned by Flotation?" *Coal Age*, Apr. 22, p. 795, and I was much interested in the announcement that investors on the London Stock Exchange were showing confidence in the matter, apparently in the belief that the scheme is practicable.

For many years I was engaged in trying to reduce the sulphur content of coal. To accomplish my purpose I washed the coal, using every method of jigging, concentrating tables, etc, but without success.

Later, about three years ago, the flotation process was drawn to my attention and I sent a sample of the coal we were mining and which contained sulphur, to a plant at Victor, Col. This plant was equipped for making a very thorough test by the flotation process. The report came back, however, that the process failed to work on the coal. It was stated that the oil simply formed a sticky mass with the finely pulverized coal, that could not be managed.

If it is possible to clean coal by flotation there is no doubt that the process will prove an important step in the purifying of certain coals for the market and for the manufacture of coke. I am wondering whether the statement made in the article mentioned is really authentic. Has some one found a way to actually clean coal by the flotation process? If so, we shall be glad to hear from him through the columns of *Coal Age*.

JOHN V. SCHAEFER, Prest.
Chicago, Ill. Cement-Gun Construction Co.

Degenerate Ideas Regarding Mine Safety

AFTER all the measures that have been employed to increase the safety of mining, it is astonishing that anyone would assume to question the wisdom of employing shotfirers where blasting is performed in mines. The suggestion can only be styled as "degenerate" and must come from some one seeking to throw a wet blanket on the efforts of others in the promotion of safety.

Of course, there would be no discussion of a subject if all men had the same opinion; but I claim that no sane argument can be advanced to show that the employment of shotfirers is harmful in any respect, provided the men so employed have a knowledge of the elementary principles of mining and are practiced in the use of explosives and competent to perform their duties as shotfirers.

Assuming it were possible to show that the employment of shotfirers is a menace to safe mining, it would then be necessary to revise our laws regulating and controlling the use of explosives in mines. Mining is progressive, and when a suggestion like this is made, men at once inquire, What safer method or what better system can be adopted for blasting coal?

To say that a mine is safe if properly ventilated shows a lack of experience, since practice teaches that many other matters than ventilation are required to accomplish this purpose. One of the greatest factors contributing to the safe operation of a mine is the exercise of discipline through the authority vested in the shotfirers.

Mining regulations in British Columbia dwell particularly on the requirements in blasting, and attach severe penalties for their violation. Under the law, competent persons must be employed as shotfirers, who are charged with the duty of seeing that the laws are carried out and strictly obeyed. This is not to say that the shotfirer is the only person wise enough to distinguish between what is right and what is wrong; but, in his official capacity, he is empowered to enforce all regulations intended to make blasting safe.

SHOTFIRERS MUST REMAIN

To eliminate the shotfirer in the mine would be to throw all precaution to the winds and return to the many unsafe practices formerly used in shooting coal. As time goes on the dangers incidental to mining are increasing, and these can only be offset by the exercise of greater care and discipline. There is much satisfaction in knowing that, with the enormous quantities of explosives now used in mines, accidents in blasting are less frequent than formerly, owing to the closer supervision of the work by shotfirers.

It may be true that some unsafe systems of shotfiring prevail. This, however, is the fault of such systems and no argument against the employment of competent shotfirers. Speaking from experience and supported by the requirements of our mining laws, I fail to see any justification for regarding shotfirers as harmful, either from a humane or a material standpoint. To displace the shotfirer would be to transfer his responsibilities to each individual miner, with the result that many bad practices would prevail and confusion take the place of order and safety. This alone should show the folly of such an attempt. In that event, we might as well scrap all our technical knowledge and mine regulations and laws relating to safe blasting.

SAFETY A DOLLARS-AND-CENTS PROPOSITION

Good business in the operation of coal mines has come to recognize the importance of a reasonable factor of safety as a dollar-and-cents proposition; and any outlay in this direction is looked upon as a wise investment. True success in mining is not indicated alone by the increased profits and a reduction in the cost-sheet; but the health and good-will of the worker has come to be considered as an important asset in the undertaking.

Formerly, the mistake was often made of attaching more importance to the returns of a venture than to its danger. Today, the order is reversed and the safety of an operation is one, if not the *first*, essential to its

success. Experience has shown that where the human side of life's business is overlooked and the dollar is placed foremost, the undertaking proves less successful in the end than where the contentment of the worker and his living and working conditions are considered of the first importance.

It is true there are some mine officials who look on the employment of shotfirers as an increase in the cost of operation; and these are prone to think there would be a saving in permitting the miners to fire their own shots in the manner and where and when they please.

Again, there are some miners who object to the shotfirer's interference in their work and profess to think they could make more money and better progress if they were not compelled to await the shotfirers. Let those who would eliminate the shotfirer say what can be done to insure safety in blasting.

Ladysmith, B. C., Canada. WILLIAM WESNEDGE.

Often Unfair to Blame the Fireboss When Explosion is Mysterious

MUCH interest has been awakened, in respect to the responsibility of the fireboss in case of a mysterious explosion, by the reading of the excellent letter of W. M. Chambers, which appeared in *Coal Age*, May 13, p. 1010. Mr. Chambers referred to the unexplained explosion that took place in the Buffalo mine in Ohio, some time ago.

Evidently, the letter was intended to impress every mine official with the importance of exercising extreme care and caution in the supervision of a mine generating gas, as many seemingly trivial occurrences lead to dangerous results. Careless practices will, sooner or later, prove fatal if allowed to exist.

THERE IS ALWAYS THE POSSIBILITY THAT A FIREBOSS HAS FAILED IN HIS DUTIES

The statement is made that the fireboss had examined the Buffalo mine a short time before and reported it "safe." This leads one to conclude that the explosion was a mystery, or that the fireboss failed to report the true condition of the mine, or had not been thorough in his examination. The fact that the testimony given following other explosions has shown that the firebosses were derelict in their performance of duty, it is reasonable to assume that the same could occur again. But, a fairminded person is reluctant to believe such was the case, until it is proven by the evidence.

True it is that a fireboss, having a large section of a mine to examine each morning, would be tempted to assume that conditions were all right in certain places with which he was thoroughly familiar, particularly if his time was growing short because he had found that a fall of roof elsewhere had broken down the brattice and gas had collected in quantity that required to be removed.

Every fireboss knows that to make an incomplete examination is dangerous and if it becomes a habit he will do it once too often, at the cost of an explosion and the possible loss of many lives. The report of the examination in that case, would show no danger or possible cause for the explosion, which would be thought to be mysterious unless the fireboss was honest enough to confess his neglect. But that is doubtful, owing to the embarassment it would cause him.

When an explosion is unexplained it is natural to assume that it was due to a sudden outburst of gas for which the fireboss would not be responsible, rather than to conclude that the man had been negligent in performing his duty. The latter conclusion, of course, would place the blame on the one man charged with the responsibility of making a complete examination of the mine, and one is naturally reluctant to do that, except where the facts point to such a conclusion.

NEGLECT OF A FIREBOSS NEEDS TO BE PROVEN

Negligence in a fireboss is surely one of the factors that must be taken into account in the investigation of a mysterious explosion. Considering that, in such a case, he is under a heavy fire of criticism and suspicion, everything should be done to remove this cloud if possible. A competent fireboss who has a good record should not be under suspicion unless the evidence warrants.

There are numerous dangerous conditions and practices in every mine, any one of which may be the cause of the disaster, and the fireboss may be responsible for these if he has done nothing to prevent them. On the other hand, a fall of rock short-circuiting the air or releasing a body of gas; the setting open of a door by a workman or driver; the stopping of the fan by accident, or its speed being reduced without his knowledge would forecast danger. These and similar occurrences would relieve the faithful fireboss of the blame for which disaster might result.

Again, although the time is short between the making of the examination by the fireboss and the entry of the men for work, it is possible for a dangerous condition to arise in a gaseous mine, for which no fireboss could be held responsible.

It must not be thought, however, that an explosion can occur in a mine and no one of the mine officials be to blame, unless they have all, without exception, done everything in their power to make the mine safe for work. Since the responsibility for safe conditions rests mainly on the fireboss, that official should exercise extreme care that his work and demeanor leaves nothing to reflect on his integrity and reliability, both in his official capacity and as a citizen.

The public will be slow to condemn a man who is known by reputation to be safe, painstaking and conscientious, except in the face of facts showing carelessness, incompetence or neglect. They will be more ready to conclude that the cause of the explosion was entirely beyond his control. As a fact, it is seldom we hear of trouble with such a fireboss in charge.

AMPLE PROVISION MUST BE MADE AGAINST POSSIBLE DANGEROUS CONDITIONS

Speaking of sudden outbursts of gas, it is often possible to anticipate such occurrences and make due provision for avoiding their consequences. Let me suggest here that the ventilating system in a mine, as far as practicable, should be so arranged that the old workings will be located on the return of the air. The working places generating gas should be carefully bratticed and a sufficient quantity of air made to reach the face at all times.

The possible circulation in a mine should be such as to handle any ordinary outburst of gas with a fair degree of safety to the men. It is usually the incapacity of the ventilating system that is directly responsible for an explosion occurring because of an increased production of gas in the workings. Where the ventilating system is not sufficient the excuse cannot be offered

that a sudden outburst of gas caused the explosion. The fault would then lie at the feet of the mine officials who failed to make ample provision against such an occurrence in the operation of a gaseous mine.

In closing, let me say there are other factors to consider in reference to mine explosions; namely, coal dust, dangerous practices in blasting, use of open lights, etc., all of which naturally come under the supervision and direction of the fireboss, the shotfirer and other mine officials. Neglect to consider these reflects on the competency of the management, in case of disaster.

Thomas, W. Va. W. H. NOONE.

Working Three Overlying Seams

THE question of working three overlying coal seams extending under the Kanawha River is a timely one and will doubtless prove of interest to many mining men who have not, as yet, experienced working under the conditions described.

In the case mentioned in this discussion, the two upper seams are said to have a thickness ranging from three to five feet; let us say an average of four feet. The upper seam lies at a depth of 50 ft. below the surface of the valley, the second seam 50 ft. lower and the third seam 60 ft. below that, making the total depth to the lowest seam 160 ft.

My plan would be to work out the two upper seams together, by sinking a shaft to the second seam, which lies at a depth of 100 ft. I would sink the shaft a little below the seam to allow for a good sump at the bottom. I would prefer to arrange to hoist the coal from each seam by a separate cage. While good sump timbers can be placed for holding the cage on the bottom in the second seam, it will be necessary to arrange a set of keeps for the cage to rest on, at the first or upper seam.

If the conditions are favorable, I would adopt the longwall method of mining each of these seams, driving only narrowwork under the river and starting the longwall face beyond. By this means, should water seep through the roof of the entries under the river, they can be protected by a good cement arch where the trouble occurs.

ADVANTAGE OF SELF-ACTING INCLINES FOR WORKING THE UPPER SEAM

In adopting the longwall method, some will prefer to keep the development in each seam equally advanced; but, my preference would be to work the upper seam by the longwall advancing method and use the retreating system in the second or middle seam for the reason that pitches can then be driven up from the second seam, on a light grade that will enable the cars to be handled by a self-acting incline.

These pitches can be driven in advance and will always be available for lowering the coal mined from the upper seam. In that case, of course, the work of retreating in the lower seam would not be started until the upper seam was practically exhausted. I have seen such a system in operation where the loaded car descending pulled up the empty, and the plan was successful, the movement of the cars being controlled by a band brake on the sheavewheel.

As quickly as the development has progressed far enough that all the coal from the upper seam is taken out through the inclines leading to the second seam, the keeps at the shaft landing in the upper seam can be taken out and both cages used for hoisting all the coal. Assuming a thickness of four feet in these two seams, it should be possible to load and hoist 250 two-ton cars from each seam, making 1,000 tons per day.

I am not in favor of any slope opening even for the upper seam, if the conditions are such that high water may occur from the blocking of the river by debris. The shaft should be kept at the highest possible level and safeguarded against such an occurrence. If the room-and-pillar method of mining is adopted the face in the upper seam should be kept a short distance, say 10 or 12 ft. ahead of that in the second seam.

As the work in the two upper seams nears completion and the coal becomes nearly exhausted, the shaft should be sunk to the lowest of these three seams, or to a depth a little more than 160 ft. to allow for a good bottom sump for drainage. The coal in this seam ranges fom 6 to 9 ft., which will make it possible to maintain the same output as came from the working of the two upper seams now practically exhausted.

The lowest seam can be worked either by the longwall method or the room-and-pillar system of mining, whichever is preferred and seems likely to produce the best results. Speaking of the inclines, I have seen what is known as the "drop staple" method, where the coal was dropped, vertically, from an overlying or upper seam to the seam below, but I prefer the self-acting incline.

Perryopolis, Pa. R. W. LIGHTBURN.

Where Should a Miner Keep His Powder Flask When Drawing Back a Pillar?

KEEPING a powder flask in a safe place in the gob when working under the conditions described by William B. Jackson, *Coal Age*, April 15, p. 771, agrees with my own practice. It is my belief that a flask containing powder or any other explosive should not be placed in a cubbyhole in the rib of a pillar that is being drawn, particularly where the action of the roof is such as to crush the coal.

At the present time I am working where gas is generated, which would increase the danger of placing a powder flask in the cubbyhole where it might be ignited by a possible explosion of gas. I consider it is far safer to hunt a good place in the gob, at a safe distance back from the place where a man is working.

Every miner ought to carefully study the conditions in his place. An experience of several years in the drawing of pillars in soft coal enables me to appreciate what Mr. Jackson has said in regard to the crushing out of the coal and its being thrown down for a considerable distance back from the end of the pillar. When working under top coal and a heavy roof pressure, in a room 20 ft. wide, where the coal was taken out to a height of 12 ft., I have known a fall of coal to cover the pillar 50 ft. back, or more.

Under these conditions, let me ask, what would have happened if I had placed my powder flask in a cubbyhole in the rib. One thing is certain, and that is, it would have been impossible to have recovered the flask until the fallen coal had been loaded out.

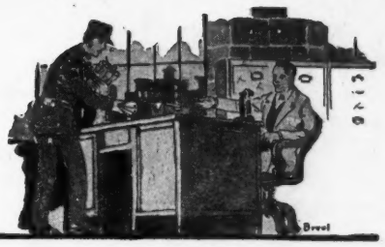
My conclusion is, therefore, that the only safe thing for a miner to do with his powder flask is to keep it under cover where it will be protected from a possible explosion of gas, and in a safe place in the gob where it will not be subject to the crushing action of the roof.

Rockwood, Tenn. PILLAR ROBBER.

Inquiries of General Interest

Answered by

James T. Beard



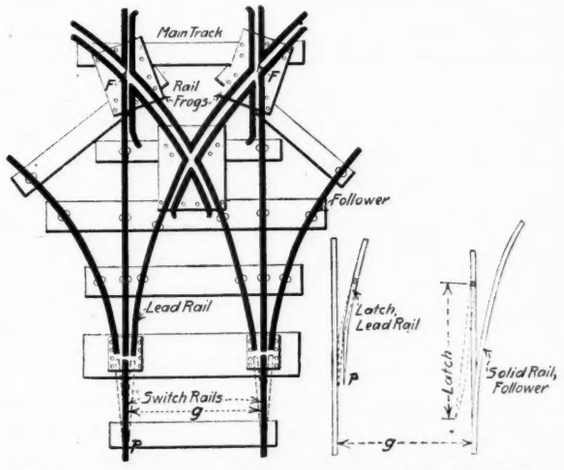
Three-Way Switch in a Mine

WE WANT to lay a three-way switch on the main entry in our mine and would greatly appreciate a diagram or explanation of how this should be done and how to calculate the length of the latches. I have drawn a rough sketch of what we want. The switches leading to the right and left of the main track start from the same point, as shown in my sketch. I remember seeing something similar to this described in *Coal Age*, some time ago, but do not remember how it was done.

————, Ky. MINE SUPERINTENDENT.

It is impracticable to use latches, in laying a three-way switch, where the switches start from the same point in the main track. In that case, what is termed a "stub-switch" must be used, or one having a single switch-rail that can be thrown into line with any one of the three rails of the main track and the two switches. Such a switch is shown in the accompanying figure.

On the other hand, if it is desired to use latches, one of the side switches must start a little in advance of the other, on the main track. It is evident that both



ILLUSTRATING A THREE-WAY MINE SWITCH

switches cannot start from the same point. A detail of a latch-switch is shown on the right, in the figure. It will be observed that, in this case, the follower rail of a side switch running to the right is one continuous rail, and the latch forms a portion of the right-hand rail in the main track. But, on the other hand, the left-hand rail of the main track is solid, while the latch on that side is made a portion of the lead rail of the switch.

The latch-switch is the common form of switch used in coal mines, as there is less danger of derailment of cars when latches are used. In either of the two kinds of switches tierods are used connecting the two latches or switch rails, as the case may be, so that they will each move alike when the switch is thrown. The tie-rods are not shown in the figure.

When laying a mine switch the first question to be decided is the frog number, which can only be determined by the conditions in the mine. Where there is plenty of room for turning the switch, especially in motor haulage, a No. 3 frog, having a spread of one in three, can be used. But where the room for turning the switch is limited, it may be necessary to use a No. 2 frog for a switch leading to a side entry, while a No. 1 frog is frequently used for a room switch.

Knowing the number of the frog (n), and the track gage (g), the length of lead rail (l) is given by the formula,

Length of lead rail, $l = 2gn$.

Thus for a track gage of $g = 36$ in. (3 ft.), and using a No. 2 frog, the length of lead rail required is

$$l = 2gn = 2 \times 3 \times 2 = 12 \text{ ft.}$$

This is the distance *PF*, measured on the rail, from the heel of switch or point of the latch, to the point of frog. The length of latch required, allowing a clearance of two inches, between the latch and the main rail, is found by multiplying the square root of twice the gage, in inches, by twice the frog number. Thus, for a track gage of 36 in. and a No. 2 frog, we have

$$\text{Length of latch} = 2n\sqrt{2g} = 2 \times 2\sqrt{2 \times 36}$$
$$= \text{say } 33\tfrac{1}{2} \text{ in.}$$

In the figure, the detail of a latch-switch is outlined on the right or to one side of the stub-switch, which forms the main portion of the figure. With the exception of these details, shown in the lower portion of the figure, the two types of switches are identical. The frogs shown are those known as "rail frogs," and are most commonly used in all mine work. The track rails and guard rails forming the frogs are riveted to heavy plates of sheet iron.

Combustion of Methane

WHAT weight of oxygen will be consumed in the complete combustion of 150 lb. of methane or marsh gas? STUDENT.

La Salle, Ill.

We first write the equation, expressing the reaction that takes place between the gas and the oxygen of the air, in the complete combustion of methane (CH_4); thus,

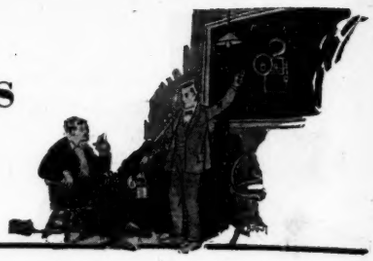
$$\underset{16}{CH_4} + 2\,\underset{64}{O_2} = \underset{44}{CO_2} + 2\,\underset{36}{H_2O}$$

The figures written below each symbol indicate the weight of each substance, respectively. It is observed that 16 parts, by weight, of methane require 64 parts, by weight, of oxygen, for its complete combustion. In other words, the weight of oxygen consumed is four times the weight of the methane burned. Therefore, the complete combustion of 150 lb. of methane will require $4 \times 150 = 600$ lb. of oxygen.

Examination Questions

Answered by

James T. Beard



Miscellaneous Questions

(Answered by Request)

Ques.—What form of piling would you use to sink through a thick bed of quicksand struck some distance below the surface?

Ans.—The best form of piling for this purpose is an interlocking series of channel bars of wrought iron in lengths convenient for driving each series of piling into the quicksand, all around the shaft. The success of the operation will depend very much on the character of the sand and the pressure or head and quantity of water flowing into the shaft. Sets of timber frames will be required to keep the piling from being forced into the shaft by the pressure from behind. At times there may occur a strong rush of water and sand that will cause the bottom to boil, making the sinking both difficult and dangerous.

Ques.—There are two airways in a mine, one of these is 6 x 12 ft., in section, and the other 4 x 9 ft., in section. If the first airway is 1,000 ft. long, what must be the length of the second airway so that they shall each pass the same quantity of air, under the same pressure?

Ans.—First, write the formula for unit pressure in terms of the airway and the quantity of air in circulation; thus,

$$p = \frac{klo q^2}{a^3}$$

By the terms of the question, p, k and q are each constant, and it is clear that l varies directly as a^3 and inversely as o. In other words, the length ratio is equal to the cube of the area ratio, multiplied by the inverse perimeter ratio, which is expressed as follows:

$$\frac{l_2}{l_1} = \left(\frac{a_2}{a_1}\right)^3 \times \frac{o_1}{o_2}; \quad \frac{l_2}{1{,}000} = \left(\frac{36}{72}\right)^3 \times \left(\frac{36}{26}\right) = \left(\frac{1}{2}\right)^3 \times \frac{18}{13}$$

$$l_2 = \frac{1{,}000 \times 18}{8 \times 13} = \frac{18{,}000}{104} = 173 + ft.$$

Ques.—Two airways of the same length have diameters of 3 ft. and 4 ft., respectively. If a pressure of 5 lb. per square foot will force the air through the 4-ft. airway, what pressure is required to pass the same quantity through the 3-ft. airway?

Ans.—For circular airways of the same length and passing the same quantity of air, the unit pressure will vary inversely as the fifth power of the diameter of the airway. In other words, the pressure ratio is equal to the fifth power of the inverse diameter ratio. Therefore, in this case, calling the required pressure x, we have.

$$\frac{x}{5} = \left(\frac{4}{3}\right)^5 = 4.214;$$

$$x = 5 \times 4.214 = 21.07 \; lb. \; per \; sq. \; ft.$$

Ques.—Three boreholes, A, B and C, were drilled from No. 10 seam to No. 9 seam overlying, for the purpose of draining the water that had accumulated in the upper seam. The boreholes are each five inches in diameter; their lengths are: A, 110 ft.; B, 80 ft.; C, 90 ft. The elevation of the surface of the water is 1,000 ft., and that of the three points of discharge are: A, 900 ft.; B, 800 ft.; C, 850 ft. The elevations are all above sea level. What quantity of water will flow through each of these boreholes, assuming the elevation of the water remains constant?

Ans.—Substracting the elevation of each point of discharge from the constant elevation of the surface of the water gives the following respective heads: A, 1,000 — 900 = 100 ft.; B, 1,000 — 800 = 200 ft.; C, 1,000 — 850 = 150 ft. Now, assuming the entrance head, due to the resistance caused by the crowding of the stream lines of the water entering the mouth of the pipe, is one-half the velocity head; and, allowing that the dril holes are cased with five-inch pipe, and taking the coefficient of friction in the pipe as 0.01, the formula giving the flow of water (G), in gallons per minute, in a pipe whose diameter is $d = 5$ in., length l and head h, both in feet, is

$$G = 20\, d^2 \sqrt{\frac{2\,dh}{3.12\,d + l}}$$

Then, substituting the given values for the diameter and length of the pipe and the head, in each respeetive case, we have the following:

A, $$G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 100}{3.12 \times 5 + 110}} = 5{,}000 \sqrt{\frac{10}{125.6}}$$
$$= 1{,}410 \; gal. \; per \; min.$$

B, $$G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 200}{3.12 \times 5 + 80}} = 5{,}000 \sqrt{\frac{20}{95.6}}$$
$$= 2{,}287 \; gal. \; per \; min.$$

C, $$G = 20 \times 5^2 \sqrt{\frac{2 \times 5 \times 150}{3.12 \times 5 + 90}} = 5{,}000 \sqrt{\frac{15}{105.6}}$$
$$= 1{,}884 \; gal. \; per \; min.$$

Ques.—The distance between a pair of cross-entries is 500 ft., and from the main entry out to the boundary line is 1,000 ft. The thickness of the seam is 6.5 ft., and the weight of the wastage in slack is 15 per cent. If the specific gravity of the whole seam is 1.3, how many tons of coal can be gotten from this block, leaving 25 per cent for pillars?

Ans.—Assuming that the main entries are parallel to the boundary line and the cross-entries driven at right angles to each, the cubic contents of the seam bounded by the main entry, the boundary line and the cross-entries is

$$500 \times 1{,}000 \times 6.5 = 3{,}250{,}000 \; cu.ft.$$

Then, taking the specific gravity of the coal as 1.3 and allowing 15 per cent for waste, which leaves 85 per cent of the seam available, the weight of this coal is

$$0.85(3{,}250{,}000 \times 62.5 \times 1.3) \div 2{,}000 = 112{,}226 \; tons$$

Finally, leaving 25 per cent or one fourth of this coal for pillars, gives a total extraction of 84,170 tons.

The Labor Situation

Edited by
R. Dawson Hall

Nottingham Drivers Were Soon Pacified

JUST one day was the duration of a strike of the drivers employed at the Nottingham mine of the Lehigh & Wilkes-Barre Coal Co. near Wilkes-Barre, called June 15. A driver had been discharged for a minor violation of the company's rules.

Maryland Miners Allege Evasion of Award

ALLEGING that the award of the Bituminous Coal Commission has not been lived up to by the operators of the Georges Creek and upper Potomac fields. the United Mine Workers of district No. 16 met in Cumberland, Md., June 15, in a three-day special convention. William J. Trickett, district secretary-treasurer, declared that a majority of the coal operators are not fulfilling their obligations under the ruling of the commission and said that he hoped that the meeting would end in a working agreement being made between mine workers and operators. Meantime, he said the leaders of the union were having much difficulty in preventing strikes.

Kentucky Miners Want Union Recognized

LABOR is again dissatisfied and, according to some prominent operators, there is a chance of another walk-out in southern Kentucky. One operator of the Harlan region stated that many of the mines were paying more than the 27 per cent increase over the old schedule, but that the workers were still not satisfied. He said: "They are getting good wages and getting in much better time than they did, but now that things are getting good they've got to find something to argue about. The new row is over the refusal of the operators to recognize the closed shop and to collect union dues by deductions on the payroll.

"We have one loader who recently pulled down $34 for one day's work, and plenty of men who make $20 to $25 a day. They'll never be satisfied, however, as they are Bolsheviki at heart."

Fairmont Region Settles Its Deadwork and Classification Problems

AFTER parleys lasting for a month or more the joint board of miners and operators of northern West Virginia constituted for the purpose of reaching an agreement as to the pay for deadwork and for agreeing upon the classification of certain kinds of labor in various localities finished its work at Fairmont during the second week of June.

General contract interpretations were agreed upon, such interpretations to form a basis for deciding disputes which may arise in the future. While the miners expressed the belief that basket men should be included in the classification as dumpers, that was not the conclusion of the board and the classification of dumpers remains the same.

The board was composed of the following operators: A. Lisle White, Clarksburg, W. Va., chairman; C. H. Tarleton, Fairmont, and Everett Drennen, Elkins, and of the following miners' representatives: J. F. Forenesch, president of subdistrict 3, Grafton; W. F. Ray, and Ira Marks, district board members, district 17.

Universal (Ind.) Miners Reach Agreement

THE contract between the United States Fuel Co., owners of the mines at Universal, Ind., and the United Mine Workers of Indiana was completed June 9 at Universal without any hitch in the proceedings. Both the miners and the operators went on record as favoring strict enforcement of the present contract. The only difference in the contract signed by the miners with the United States Fuel Co. and the one signed some time ago with the Indiana Bituminous Coal Operators' Association, which has been causing some slight trouble in subdistrict No. 2, is the clause which provides for the settling of disputes. These will be taken up by Ed Stewart, president of the miners, with the secretary of the company.

Insurgents Would Oust Union Officers

A "RUMP" convention of miners was recently held in Sullivan County, Indiana, at which resolutions were passed against the present wage contract and against the officers of district No. 11. Clinton Local No. 2,446 showed itself firmly in support of the district leaders and the contract.

When Salmond, who had been made chairman of the grievance committee of the "rump" convention, and whose duty as such was to go over the district and assist in organizing against the present officers of the regular organization, went before his local union to make his report he was received quietly but dourly. When he had finished his talk the local advised him to withdraw immediately from the committee and have nothing further to do with the movement.

Common Viewpoint Ends Indiana Dispute

COAL operators and miners in Clinton, Ind., believe that the trouble arising from the controversy about the lifting of bottom coal and also that regarding the Saturday holiday movement has come to an end. Miners say that the Saturday holiday does not at this time appear to be feasible, as it keeps the railroad cars idle. Many of the miners expect to go to work when the mines are marked up for a Saturday run. The loaders and operators appear to be standing together in the demand that the machine men cut the coal within 3 in. of the bottom at the front of the cut and down to the bottom at the back.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Additional Injunctions Against Assigned Cars Sought

ADDITIONAL injunction suits have been filed by the National Coal Association against railroads practicing the use of assigned cars. The new suits are against the Pennsylvania, the Chesapeake & Ohio, and the Southern Railway. The initial suit was filed against the Baltimore & Ohio Railroad. Other suits will be filed soon, as the National Coal Association has determined to press this matter in the most vigorous way possible.

Coal Men Want Claim Settlement Rules Published

THE American Wholesale Coal Association is taking vigorous measures in order to have the Director General of Railroads publish the set of rules for settlement of claims which were agreed to and adopted over a year ago. The original rules were the result of a conference between the claim agents and representatives of the coal operators, jobbers and retailers, and the National Industrial Traffic League. At the time they were agreed to John Barton Payne, then attorney in charge of these matters for the Railroad Administration, advised against promulgation, and they have been held up by the Railroad Administration ever since.

Natural Gas Interests Confer on Conservation Program

DEFINITE progress was made in the Natural Gas Conservation conference at the Department of the Interior on June 11, when tentative resolutions proposed by the National Committee on Natural Gas Conservation were approved. The conference included representatives of the governors and public service commissions of a number of the important natural-gas producing and consuming states.

One of the most important results of the conference, aside from the adoption of the resolutions, was the tentative agreement by state officials in Pennsylvania, West Virginia and Ohio to hold a conference the latter part of this month in Pittsburgh, with a view to formulation of a policy that will be mutually satisfactory to the gas interests in the tri-state fields. The problem of export of natural gas from West Virginia into Ohio and Pennsylvania for a number of years has been a difficult one. It is hoped that the coming conference will be able to proceed on the basis of the proposed resolutions to more effective measures than have previously been possible.

It is also expected that some regulations will be introduced in the Louisiana State Legislature by Mr. M. L. Alexander a member of the Conservation Committee of that state, in order to give effect to the conservation measures recommended by the resolutions adopted at the conference.

Geological Survey to Study Eastern Power Possibilities

THE U. S. Geological Survey has been authorized, by the Sundry Civil bill, to proceed with the superpower survey for the industrial region, Boston to Washington. The bill also provides an appropriation of $125,000, together with authority to receive additional sums which may be contributed to the work. This survey will include a study of the possibilities of water power compared with coking of coal- and steam-power plants, both at the mine and at seaboard. It is expected that several experts of wide experience will be engaged by the Survey to direct the investigation.

President Signs Water-Power Bill

AFTER thirty years of discussion the nation finally has a water-power policy. Announcement was made June 18 that the President had affixed his signature to the water-power bill previous to June 11, the date of expiration of the ten-day interval allowed for signing bills according to a decision of the Attorney General. This places upon the statute books of the nation a measure dealing comprehensively with water-power developments both on public lands and on navigable waters.

When it is considered that the nation's potential water-power capacity exceeds 60,000,000 horsepower it can be seen that this legislation is likely to have an important bearing on the general fuel situation. At present the country has but 5,000,000 horsepower of developed water powers. While considerable development of water power is expected to begin at once, it is recognized that the conditions laid down by the bill are strict, and it is problematical as to how attractive the development of these power sites may be to capital under its provisions.

Senator Jones of Washington, who is in charge of the legislation in the Senate, is authority for the following statement:

"Every water-horsepower going to waste which could be substituted economically for fuel power would represent approximately five and one-half tons of coal per year, based on an average of twelve hours per day. The labor of one man is released for other uses every time 50 hydro-electric horsepower is developed and every 150 water horsepower developed releases one freight car for other duty.

"This act means a saving of coal and a lower price for that used; a saving of oil and a lower price for that consumed; more efficient transportation and lower cost for service; the development of new industries; the building up of new communities; the creation of new property values, subject to taxation for the support and maintenance of local and state government."

Attorney General Orders Indictment of Coal Profiteers

AS THE result of complaints to the Department of Justice that soft coal operators are profiteering Attorney General Palmer has ordered the prosecution of the offenders. Instructions were issued June 17 to Federal attorneys throughout the country to investigate the cases reported and to prosecute where the evidence warrants.

The complaints allege that coal prices range from $7 to $11 per ton at the mines. According to the Attorney General the cost of production has only increased to $2.79 per ton. Legal action in the cases would be taken under the Lever act, which prohibits unreasonable profits in coal and other necessaries. The Attorney General's instructions to the Government Attorneys follow:

"The department is receiving a number of letters in which complaint is made that bituminous coal prices at the mines now range from $7 to $11 a ton, with a further increase imminent. The writers say that operators are attributing the advanced prices to car shortage and export demand, emphasis being placed upon the export demand.

"Production cost figures gathered by the Federal Trade Commission from 1,589 bituminous operators from the principal producing regions, mining roughly about 60 per cent of the annual output, show that during January, 1920, their costs per ton averaged $2.32 at the mines. Since then there has been an increase of 27 per cent in the cost of labor, enhancing the production cost to $2.79 per ton. The accuracy of these figures is borne out by information in letters coming to the department from purchasers of coal, from which it appears that prices in May did not greatly exceed those furnished to the Federal Trade Commission for January.

"This situation demands the prompt attention of all United States Attorneys. Please give special attention to this matter and seek indictments where investigation discloses that an unreasonable profit has been taken, advising the department of the action that is taken."

Movement of Coal Through the Sault Ste. Marie Canals

SHIPMENTS of coal passing westbound through the Sault Ste. Marie canals during the two months ending with May, according to figures prepared by the U. S. Bureau of Foreign and Domestic Commerce, amounted to 212,000 short tons of anthracite and 582,206 short tons of bituminous.

During the same period of 1919 the totals were: Anthracite, 391,127 short tons, bituminous, 2,655,562 short tons.

Coal Men Endorse Priority Order, but Oppose Assignment of Cars

AFTER having had a few days to study the rather intricate and vague language of the service order of the Interstate Commerce Commission with regard to priority for coal moving to New England, coal men generally are of the opinion that the step is a wise one and probably can be worked out without serious disturbances. Just as service order 5 gave priority to coal moving to pools over coal not moving to pools, order 6 gives priority as between coal moving to New England and coal intended for export.

The order, however, does raise a very serious question, coal men believe, in that it aggravates the practice of assigning cars. No difference can be seen in principle in assigning cars to James J. Storrow as compared with cars assigned to a mine which is producing fuel for railroads.

War Department Awards Contracts for Coal for Western Posts

AWARDS have been made by the War Department covering 800,000 tons of coal to be used at army posts in the West. Because of the conditions of delivery there was a wide range of prices, but most of the coal on which a mine price was quoted varied from $2.70 to $4 per ton. It will be recalled that the army rejected the bids submitted for the coal needed at its Eastern stations. New bids are to be opened July 15.

Trade Report Requirement Suspended Pending Result of Legal Action

AN AGREEMENT was reached Monday by the Federal Trade Commission and the iron and steel companies contesting its right to require monthly reports whereby no steps will be taken against other companies pending the outcome of the cases to be tried in Philadelphia and Trenton.

President's Anthracite Committee to Hold First Meeting in Scranton Today

THE Anthracite Wage Commission decided early this week to hold its first meeting in Scranton today and chose for its chairman William C. Thompson. He is president of Ohio State University and represents the interest of the public in the controversy.

Matewan Tragedy Followed by Marriage

AN AFTERMATH of the Matewan (W. Va.) tragedy of May 19, in which a number of Baldwin-Felts detectives were shot down following an eviction of coal-mine employees, occurred early in this month when Sid Hatfield, chief of police of that town, and Mrs. C. C. Testerman, wife of the mayor, who was killed on the date mentioned, were married. When Testerman and Albert Felts were killed, Testerman, Felts and Hatfield were congregated at the entrance to the village store. Only two weeks later, Hatfield and Mrs. Testerman were married.

Discrimination in Freight Handling Violates Law, Judge Says

IN a decision enjoining certain deep-sea steamship companies from refusing to handle merchandise barred by union labor, Justice Lewis L. Fawcett, New York Supreme Court, says:

"The representatives of the companies who decline to furnish service are violating the law, and the employers where strikes are threatened to compel them to violate the law are engaged in an illegal combination. The carriers have aided and encouraged the unions by seeking to evade their duties to handle plaintiff's goods without discrimination.

"While a man may enter any vocation he chooses, yet if he selects a field indissolubly linked with the rights of the public, such as a common carrier, he must subserve his own rights to that of the public welfare.

"The combination violates the United States Shipping Act and Section 5,440 of the Revised Statutes. Under these statutes a refusal of the carriers to transport the plaintiff's merchandise is a crime, and the unions are engaged in an unlawful conspiracy when they induce, aid or abet the carriers in committing the same, and it is no excuse to the carriers that the employees threaten to strike."

Britain Suspends in Part Government Control of Coal Industry

IN announcing the suspension of the operation of the Household Fuel and Lighting Order, 1919, beginning June 7, the London correspondent of the *Journal of Commerce* states that the Government through the Coal Controller controls both the production and marketing of coal. Technically the Government is in possession of the collieries, and while the management has been left free profits the allocation of coal to export and home requirements and the pithead price have been strictly controlled.

The Government also has controlled wages to the extent that it has acted as the final court of appeal. Marketing of coal, wholesale and retail, also has been strictly controlled. Profits have been limited under the Wholesale Prices Order and the Retail Prices Order. So far as household coal is concerned, the Government has controlled the allocation and purchasing by registering merchants and rationing the consumers. Under the Retail Prices Order local authorities and local fuel overseers have adjusted prices from time to time to meet the increased costs. The system has entailed a heavy administrative burden on the Coal Controller's Department.

The country was very near a coal famine once or twice last winter. Supplies were very limited, and there is an enormous increase in the industrial demand. A very large staff has been employed. The local fuel overseers alone have cost £400,000 a year. In addition there have been divisional offices and officers, traffic superintendents, and their staffs.

The Government's intention is for the present to retain control of production, but to wipe out control of marketing. This will give the coal consumers at home complete freedom of action once more, the consumer will be able to get coal of the quality required, and it is expected that cleaner coal will soon be available.

Fuel overseers and the rest of the large staff employed on the marketing side of control will be released, considerable economies thus becoming possible in the Coal Controller's department, and a very heavy burden of administrative work will be lifted.

Suspension of control becomes effective June 7. This step could only be taken in the summer time, and it is only possible on the present output with a restriction of exports. Exports have been cut down to about 2,000,000 gross tons a month. To provide for the increased demand at home they are now to be cut down to 1,750,000 gross tons per month. The exports committee has agreed to this reduction in view of the necessity for meeting home demands.

In each coal producing area a Board of Trade committee has been sitting under the system of control. With the lifting of control those committees will remain. They will be so arranged as to have on them representatives of the coal owners, the merchants and factors, and consumers. Any complaints as to short supplies in particular districts would by this means be brought to the direct notice of the coal owners. These committees will exercise a supervising interest and will be coordinated by a central committee meeting in London.

There is little prospect of an immediate reduction of price as the result of the lifting of Government control; equally there should be no increase; the removal of control renews competition among merchants and factors, which should tend to lower prices gradually, and the consumer is protected under the Profiteering Act.

The Government through its control experiences is in possession of ample evidence as to cost of production and transport from the pit right down to the consumer, which will be available to the Board of Trade and all profiteering committees. This will exercise sufficient restraint against any attempt to raise the cost of coal to the home consumer.

Smokeless Operators Ask Revision of Navy Coal List

REVISION of the navy's preferential list of coal mines is likely to result from a full discussion of the subject by smokeless operators with navy officials on June 18. It was pointed out that under present conditions the navy's policy works an extreme hardship on the comparatively few mines which are called upon to furnish this coal at a very reduced price. While the hope is entertained that the preferential list can be abolished entirely, it is regarded as practically certain that at least a more general distribution of the navy's requirements will be secured.

The smokeless operators designated O. M. Deyerle, president of the Flat Top Fuel Co., to represent shippers on the Norfolk & Western, and Frank Ellison, general manager of the C. G. Blake Coal Co., to represent shippers on the Chesapeake & Ohio and the Virginian railways. Mr. Deyerle and Mr. Ellison will work out the details of the revision with Commander Hilton of the Navy Department.

Indiana Production Decreases Slightly

PRODUCTION of coal at 192 mines in Indiana in the week of June 12 is reported as 533,174 net tons, a slight decrease compared with the week preceding. These mines operated 62.4 per cent of full time, with car shortage accounting for 29 per cent of full time lost. The other causes contributing to lack of production were labor trouble, mainly in the Evansville and Linton districts, and mine disability.

British Coal Exporters Protest New Government Restriction

AT a meeting held June 11 at Cardiff, according to a cable despatch to the *Journal of Commerce*, the Coal Exporters' Association passed the following resolution:—"The coal exporters, while anxious to support the policy of the Government in providing adequate supplies of coal for inland use, protest strongly against the vexatious and unworkable conditions now enforced on shipments of what coal is available."

Newcastle reports that official information has been received that the Durham allocation of coal for export amounts to 350,000 tons per month, each colliery to supply a certain percentage to individual countries. The percentage is apparently based on output, not on grade of coal mined, and it is assumed therefore that all coals will have to be shipped as wrought. In perspective all screening machinery will be scrapped and foreign buyers must take unscreened coals or do without.

The scheme is considered altogether unworkable and a deputation is proceeding to London to discuss the situation with the Coal Controller. It is expected that many mines will remain idle for a while.

Coal Interests Urge Higher Freight Rates At Commission Hearings

NO SERIOUS objection to an increase in coal rates by the railroads was registered by representatives of the coal industry who appeared before the Interstate Commerce Commission June 16 and 17. In fact, practically every witness expressed a hope that the carriers would be granted an increase which would permit of adequate improvements and replacement of equipment. Practically the entire hearing was consumed in making comparison of rates between the various mining districts. It was asked that the distortions which grew out of general order No. 25 be recognized by the commission in any increase which it may make on coal.

It was argued that it is in the interest of the consumer, the general public, the operators, and the carriers that the well-established differentials be preserved. Many of them, it was pointed out, have been fixed by the Interstate Commerce Commission after litigation and after extensive hearings. To disrupt them would bring about great confusion, it was argued. The relative merits of a flat rate in cents per ton as compared with the percentage increase was presented at length.

One of the contentions made was that short-haul coal is bearing more than its proper proportion of freight rates. It was predicted that any further increase will encourage the production of power at the mines, thus reducing carriers' revenue. It was pointed out that in many cases at present the freight charges to points relatively close to mines already equal the cost of maintaining an overhead line for the transmission of power.

Due to the local nature of the question the National Coal Association took no part in the proceedings other than to introduce as a part of the record the resolution adopted at the Atlantic City convention, which reads as follows:

Whereas, the present insufficient production of coal is directly due to the lack of adequate transportation facilities, and whereas the quickest way to rehabilitate the railroads and enable them to secure the needed equipment and give the service which will tend to reduce the cost of production of all commodities, including coal, is to re-establish railroad financial credit,

Therefore be it resolved that the coal industry recognizes the need for an immediate increase in the revenues of the railroads, sufficient to insure their solvency and prosperity, by means of an increase in freight and passenger rates. However, the coal industry desires assurance from the Interstate Commerce Commission that this endorsement of an immed ate increase in all freight rates will not prejudice the right of any parties interested to obtain redress hereafter, first if the differentials are inequitable, as between different mines or different producing districts, and second, if rates themselves are excessive, unreasonable or discriminatory.

The coal industry desires to call attention to the fact that the coal consumers have already borne more than their share of increased cost of transportation and that the public welfare might be conserved by adopting a higher percentage of increase on freight of greater value and a lower percentage of increase than proposed on coal, which is the basis of industry.

Predicts Sufficient Coal Next Winter

PLENTY of bituminous coal next winter is predicted by George H. Cushing, managing director of the American Wholesale Coal Association, in an address before the City Club of Washington, D. C., on June 15.

Mr. Cushing cited the following figures bearing on the coal production of the nation:

"Since April 1 we have records of the production during nine weeks. The bituminous output of this year compared with last has been: 1920, 80,521,000 tons; 1919, 72,818,000 tons; gain, 7,703,000 tons.

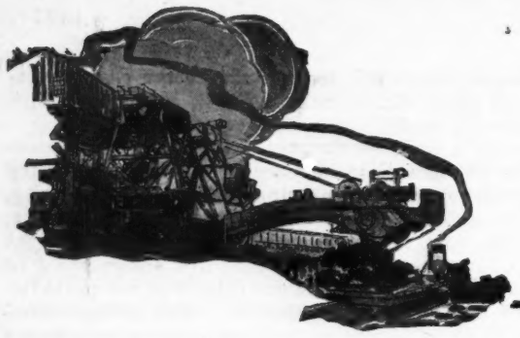
"The average weekly production since April 1 has been: 1920, 8,946,000 tons; 1919, 8,090,900 tons; gain, 855,800 tons.

"The average monthly production has, accordingly, shown a gain of 3,708,450 tons. Last year, with the smaller production, we had accumulated a sufficient storage to help tide us over the worst miners' strike in history. Running ahead, now, of production of last year, I cannot believe the current statements that we are running headlong into a dreadful shortage of coal.

"I know what is being said on the other side of the question. I do not believe it. The fact is that we have a demand which if it were spread in equal monthly proportions over the year would call for a production of 10,300,000 tons per week. The fact that for nine weeks we have been getting a weekly average of only 8,946,700 tons indicates that we are accumulating a shortage at the rate of 1,353,000 tons per week. That would be bad if it were to continue until the end of the year.

"The fact is that we have never, in peace times, had a serious bituminous coal shortage. Yet never, in peace times, have we moved bituminous coal in equal monthly installments. We have always fallen much below our present level of production in summer and then made up the shortage—or seeming shortage—in the fall months. That is what we did last year. We are going to have less of a shortage to make up this fall then we did last, for the reason that we are moving now 3,700,000 tons of coal more to market per month than we did a year ago.

"The plain and simple fact is that we have other and proper uses for open-top cars in the summer. Those uses disappear in the fall. The cars then revert to the coal trade, and production naturally grows in response. That allows coal production to equal demand at the time of use."



Production and the Market

Weekly Review

Interstate Commerce Commission Orders Preference and Priority to New England Coal Shipments to Tidewater—Production Goes Up and Promises to Climb Higher—Order Confining Open-Top Cars to Coal Will Help—Prices Still Going Up.

ARBITRARILY taking several hundred thousand tons a week out of the supply for export will force prices for foreign delivery to even higher levels. At the same time the high prices at tide are due to drop for New England buyers, and with gradual but consistent gains being made in production each week and the benefit to car supply that is certain to follow the order limiting for the next thirty days the use of open-top cars to coal an easier market is looked for over the East generally.

Prices continue to occupy first place in the interest of the public. The Attorney General has issued instructions to his field force to prosecute those dealing in $10 coal, mine price. It is noteworthy that in Illinois mine prices are regularly quoted lower for southern coal than for that from central and northern Illinois, although usually selling for higher prices. The operators in the south field seem to be exercising somewhat greater restraint than the others.

Southern West Virginia coal is now moving west and in the next few weeks the situation will be much easier in the Chicago market. Meanwhile such points as Louisville, St. Louis, Milwaukee and Detroit are struggling to get supplies and are anxiously awaiting the heralded movement of empties ordered in from the West a month ago.

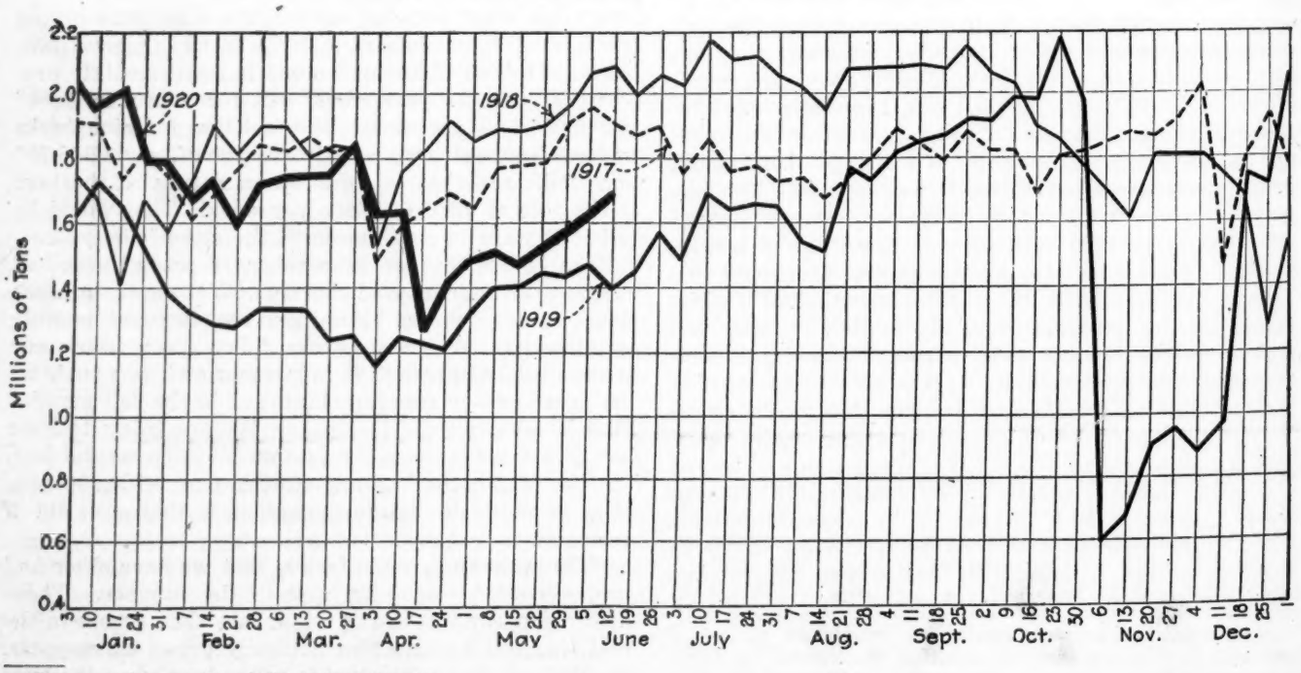
Anthracite is steadily gaining in total output, but whether or not a considerable portion of the increase is washery coal that does not add to the supply of domestic sizes, no information is available. New England has not been concerned until recently about the shipments of hard coal, but the West has been complaining of short movement compared with last year.

Lake Coal Dumped Season to June 19

(NET TONS)

	Cargo	Fuel	Total
1919.....	7,160,600	325,970	7,486,570
1920.....	2,487,800	245,600	2,733,400

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Spot Prices Seem To Have No Limit—Buyers Strive to Get Coal—Federal Aid Is Invoked—Tidewater Piers Are Congested and Hampton Roads Loading Is Slow—Anthracite Movement Slackens, Causing Much Anxiety.

Bituminous—The spot market on steam grades continues its amazing upward swing. Only 60 days ago there was a strong feeling in the trade that operators would hardly dare mark up prices beyond $6 per net ton at the mines, but at this writing the $11 mark has been passed and $12 is near at hand. There is no sign of price recession and there is still the same clamoring for quick coal that has been characteristic for more than six weeks.

Every wholesale office is besieged with eager buyers. Middle-houses are buying of one another, and conservative consumers who were inclined to wait developments are now thoroughly alarmed and seeking coal at the best price obtainable.

The situation has been taken to Washington. Efforts have focussed on the Interstate Commerce Commission and a hearing was recently held. It was urged that some form of priority in car-supply should be granted this territory, such as has been given the Lake market.

One difficulty is that both Hampton Roads and the Lake territory draw quite largely from the West Virginia fields, while New England is now much more largely supplied from central Pennsylvania, as indeed are New York, New Jersey, and Pennsylvania itself, not to speak of heavy consuming districts in Canada.

The car movement is really improving. Cars have reached New England from beyond Pittsburgh in less than ten days, and the railroads are handling coal traffic in much better fashion.

The tidewater piers, especially at New York, show signs of congestion. Some of the embargoes have been lifted, but the labor situation and the great difficulty of shifting cars and boats are together causing such delays as to make terminal conditions almost impossible. Bottoms have accumulated to greater extent than at any time heretofore this season.

At Hampton Roads there have been further delays the past week. Demurrage charges have accrued on most of the boats listed to load on coastwise business, and re-handlers here have been obliged to mark up prices in consequence. Prices on cars Providence have advanced from $11.50 to $12.50 within a day or two, and at Boston there have been sales up to $16.

The New Haven R.R. has resumed seizing coal in comprehensive amounts. But a system of permits has now been worked out and under the close supervision of division superintendents, industries really in need of fuel are enabled to have their coal protected.

Current prices on bituminous at wholesale range about as follows:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	$9.75@$11.25	$10.25@$11.50
F.o.b. Philadelphia, gross tons	12.80@14.50	13.40@ 14.80
F.o.b. New York, gross tons	13.15@14.85	13.75@ 15.00

Anthracite—Due to renewed urgent inquiry from the Middle West, shipments both all-rail and to tidewater have both appreciably slackened. Domestic sizes are in quite strong demand. The retail dealers are making no secret of their anxiety and by September there is certain to be a mild form of panic to get covered for ordinary requirements.

The weather has interfered with movement by water to a considerable extent during the past fortnight, and as a result receipts here will show quite a falling-off as compared with figures for May. The steam sizes continue in fair request, but there is by no means the buying power to the market for this fuel that might have been anticipated.

Tidewater

NEW YORK

Anthracite Demand Is Strong and Receipts Are Comparatively Low for the Season—Domestic Sizes Needed Here—Movement of Steam Sizes Is Brisk—Bituminous Demand Increases and Coal Moves in Good Volume — Consumers Look for a Break in the Market.

Anthracite—With the demand remaining strong the dealers here are in the market for heavier tonnages than they now receive. Receipts of coal are not as they should be at this season but the trade is not complaining as they realize that New York is being well cared for when the local harbor labor troubles and the demand from the Lake ports are considered. Demand along the line is also strong.

While production is heavy, some shippers fear that with the efforts being made to secure a stronger movement of bituminous, the car supply at the anthracite mines will be cut down.

In this market the companies are barely able to take care of the immediate requirements of the retail dealers and the latter in turn are far behind in their orders to their customers. However, nearly all consumers have some coal in their bins.

The steam coals are finding a steady market. Barley is a little sluggish but buckwheat and rice are active. Considerable of the activity is attributed to the high prices quoted for bituminous.

Quotations for other than company product, at the mines, range about as follows: Buckwheat, $4.25 to $4.75; rice, $3 to $3.75; and barley, $1.75 to $2.25.

Current quotations for company coals, per gross tons, at the mine and f.o.b. New York Tidewater, at the lower ports, are as follows:—

	Mine	Tidewater
Broken	$7.30–$7.50	$9.15–$9.35
Egg	7.30– 7.45	9.15– 9.30
Stove	7.55– 7.80	9.40– 9.65
Chestnut	7.60– 7.80	9.45– 9.65
Pea	5.85– 6.25	7.60– 8.00
Buckwheat	4.00– 4.10	5.75– 5.85
Rice	3.00– 3.50	4.75– 5.25
Barley	2.25– 2.50	4.00– 4.25
Boiler	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c higher on account of the differences in freight rates.

Bituminous—The increasing demand for fuel continues while the quotations for "anything that looks like coal" seem to be seeking new levels. Prices for coal at the mines are higher than a week ago and there has been a corresponding increase in quotations at this tidewater. Much of the high prices are due to the insistency of buyers who are in the coal fields and are bidding against each other.

Water deliveries in this harbor continue to be delayed because of the marine troubles. Heavy towing charges remain in force driving prices for boats alongside to around $15. Loaded boats are being quoted from $13 to $14, with rumors that slightly higher quotations have been made.

Quotations at the mines vary and while they generally show an advance over those of the previous week it is said that some operators are letting their products go at lower figures. Fair grades of Pennsylvania coals were quoted around $10 with quotations for gas coal at about the same figure. Car supply was slightly better on all roads.

PHILADELPHIA

Dealers Are Unable To Accumulate Anthracite Stocks — Pea and Chestnut Are Short — Stove in Greatest Demand — Steam Coals Are Active, Except Barley — Production at Mines Keeps Up, but Car Supply Diminishes—Heavy Volume of Bituminous Goes to Tide—Record Prices Are Asked.

Anthracite—Moderate tonnages of anthracite continue to reach the city, although dealers so far have been unable to accumulate any reserve stocks. The amount of coal coming in is still sufficient to keep delivery equipment busy, yet the fact that coal is being sent out as fast as it comes in is causing uneasiness among the trade.

Pea coal is actually scarce now;

heretofore it has always piled up at this time of the year. For the past four years the use of this size has extended to an ever-widening territory. At this time the West is taking considerable quantities and among the premium shippers it is stated they are getting as high as $9.75 at the mines for this size.

The size still called for in greatest volume is stove, but no dealer pretends to be able to meet the demand for it. Chestnut coal is also short. The demand for egg keeps up without any sign of diminishing as the season advances.

The steam coals are moving nicely, with the exception of barley. Buckwheat is actually tight and the companies with prices of $4 and $4.10 have all the business they can handle. The independents are getting prices ranging from $4.25 to $4.50 for this size and moving all they can produce. Rice is also quite active, due probably to the scarcity of soft coal. Barley continues stagnant. With the big consumer there seems to be a tendency to permanently change a portion of the boiler equipment so as to be able to take advantage of a situation such as the present, with soft coal sky high and an over-production of barley.

Bituminous—It is claimed that soft coal has shown an increase in production recently. But all week at the mines, prices have hovered closely around $10 and sales even at $11 have not been rare.

However, the big producers have no coal to offer on the spot market, most of them being hard put to try to meet their contract obligations.

As yet the operators will not admit that the car supply has appreciably improved. Those concerns willing to take railway-supply coal, on the basis of $4 to $4.25 at the mines, are the only ones thus far who are able to make anywhere near full working time.

There continues to be a heavy volume of coal going to tide to the various pools. There is a particularly heavy tonnage of gas coals in the pools awaiting vessels for export. Due to the longshoremen's strike, loading has been somewhat delayed and coal has accumulated awaiting the berthing of vessels. The average price for coal at tide is close to $10, although at times during the past two weeks it is reported sales were made around $15.

BALTIMORE

Transportation Conditions and Terminal Congestion Force Export Embargo—Poor Car Supply and Movement of Loads Keep Price Sky High — Anthracite Receipts Are Slow and Prices Advancing.

Bituminous—A continued poor run of cars at the mines, a poor railroad movement, systems jammed with coal on sidings and terminals at tide also crowded with standing cars, faced the trade here the past week. Since midnight of June 15, the Baltimore & Ohio has operated an embargo against all shipments to tide on export, and even the outstanding permits were cancelled.

Coal and ships have to be actually at hand to get results at the pier here. At this writing there are more than 2,000 loaded cars at the B. & O. piers, with 24 ships waiting to take on 144,000 tons on export and coastwise hauls, and with dumpings only averaging a little above 300 cars a day at that point.

The secret of the situation seems to be in poor transportation—poor supply of empties and a poor movement of loaded cars.

Best coals are still selling f.o.b. mines the net ton at between $10 and $10.50, with both export interests and domestic consumers competing for the fuel. Medium-grade coals readily bring $9 and better, while the poorest coals are worth from $8.25 to $8.50. Exports were running quite heavy up to the time the embargo was put into effect, and even now are large. The first half of June saw a loading of more than 250,000 tons of export cargo coal, with the ships taking more than 60,000 tons additional for bunker use.

Anthracite—The receipts of hard coal continue most unsatisfactory. Deliveries to cellars here are far behind this period of last year. And this year those with orders on the books now realize that they will not get the coal at the price at time of order and are urging deliveries, knowing that still higher rates are coming. Meanwhile almost every notice from mine connections shows some advance in wholesale price, and thus overhead costs keep mounting.

Lake

BUFFALO

Slight Improvement in Soft Coal Movement—Demand Is Fair with Most Coal Moving Under Contract — Anthracite Situation and Lake Trade Good—Coke Market Is Unsteady.

Bituminous—The improvement in coal movement is small and complaints from mine owners continue. Allegheny Valley operators especially note poor transportation. If the cars were at all adequate, the present frightful state of prices would last but a short time. As it is the mine prices soar to close to $10.

The demand is fair. Some jobbers are staying out of the market almost entirely beyond looking after their old customers and seeing that they do not run out of coal. A large part of the coal is moving under contract.

Anthracite—The demand continues good and the local supply at least is fair. Never before has so much anthracite been sold here so early in the year. The Canadian supply does not appear to be so good, for a large number of dealers have been here lately, asking for coal.

An odd feature of the trade is the slow sale of the steam sizes of anthracite. It is shown that this coal costs much less than bituminous and yet it is hard to get firemen to use it.

In the Lake trade the movement is good, with one trestle still idle, the amount loaded for the week being 121,400 net tons, of which 30,100 tons cleared for Milwaukee, 28,100 tons for Duluth-Superior, 25,400 tons for Chicago, 12,700 tons for Fort Williams, 7,700 tons for Port Arthur, 7,400 tons for Escanaba, 7,000 tons for Sheboygan and 3,000 tons for Green Bay.

Freight rates are 65c. to Chicago, 60c. to Milwaukee, 55c. to Sheboygan, Green Bay and Escanaba, 50c. to the Lake Superior ports.

Coke—The trade is in quite an unsteady condition, with all sorts of prices asked for single-order shipments. The latest report is of $15.50 at the ovens for both foundry and furnace, with little demand for the domestic sizes. The few sales reported differ about $3 per ton within a week. Only a small part of the consumption is outside of the contracts.

CLEVELAND

Continuous Operation of Mines Is Urged on I. C. C.—Situation Improves Slowly, but Famine Conditions Threaten—Only Anthracite on Hand.

Bituminous—Following a conference with railroad officials and the manager of the Ore and Coal Exchange, operators in the No. 8 district with headquarters in Cleveland, have sent an appeal to the Interstate Commerce Commission for the means of "continuous operation of the mines." This can only be accomplished through adequate supply of cars at the mine mouth.

Complaint continues that cars ordered East from the Western states have not appeared in appreciable quantities in the coal regions supplying this district. Coal men say that the small improvement that has been seen cannot be traced to the heralded car movement from the West.

Most plants continue to operate on a hand-to-mouth basis with respect to coal and efforts to get sufficient coal to prevent shut downs is almost frantic in numerous cases. There has been some improvement in the railroad labor situation, but conditions are still deplorable. As high as $8 is still being offered by consumers in dire need but spot supplies even at that price are almost unobtainable.

Pocahontas and Anthracite—Anthracite coal is about the only grade of coal on hand in dealers' yards, and most retailers are accepting orders for delivery of anthracite but for nothing else. Anthracite prices remain unchanged. Pocahontas supplies have almost reached the vanishing point and retailers are refusing to quote prices or guarantee deliveries. The supply is said to be about five per cent of the demand at present.

Low operations, unusual shipments to tidewater from the mine districts supplying Cleveland and diversion of supplies to supply the Lake trade, are the chief reasons why retailers are short

of supplies. Some of them are getting coal from the Indiana fields, a novelty in Cleveland.

Lake Trade—The new pooling arrangement for shipments up the Lakes went into effect a few days ago, and substantial betterment is already indicated. In the first half of June 18,000 tons of coal were loaded at the docks against 15,000 tons during the last 15 days of May.

Retail prices of coal per net ton delivered in Cleveland are as follows: Anthracite—egg $13.20; grate, $13.20 and $13.50; chestnut and stove, $13.50.

Pocahontas—shoveled lump, $11.75, and mine-run, $9.25. Domestic Bituminous—West Virginia splint, $11.75; No. 8 Pittsburgh, $8.75; Millfield lump, $11.75; and Cannel lump, $12. Steam coal—No. 6 and No. 8 slack, $8.50 to $8.75; No. 6 and No. 8 mine-run, $8.50 and $8.75; and No. 8 ¾-in. lump, $8.50 to $8.75.

Inland West

COLUMBUS

Car Shortage Curtails Production — High Prices Still Prevail as the Result of Bidding for Tonnage—Factories Are Forced To Suspend Operations and Domestic Demand is Insistent — Lake Trade Continues Slow.

The Ohio coal trade has been rather strenuous during the past week, with the demand for all grades stronger than ever, and curtailed production as the result of the car shortage. Prices are still mounting. In fact new high levels have been reached and it is believed that the end is not in sight.

The steam trade is probably the strongest feature at this time. With factories suspending operations because of lack of fuel, purchasing agents are in a mad chase after tonnage.

Domestic demand is becoming more insistent as the public has come to realize that there may be an acute fuel shortage this winter. The price is not the question, but rather the ability to g the tonnage.

A fair amount of West Virginia splint is arriving and quickly delivered. Practically no Pocahontas is obtainable on the local market. Hocking and Pomeroy grades constitute the bulk of domestic business. Retail stocks are short and in some instances almost exhausted.

Retail prices are higher, as Hocking lump retails at $8.50 and mine-run at practically the same figure. West Virginia splint sells in the neighborhood of $.\.50 and Pocahontas around $11.

The lake trade continues slow, according to the reports from the docks o? Lake Erie. Loadings to date are less than 20 per cent of last year's records and unless some radical action is taken the Northwest will be quite short of fuel. Vessels are plentiful but the tonnage is not available.

Prices at the mines for the principal grades used in central Ohio are:

Hocking lump	$6.00 to $7.50
Hocking mine-run	5.75 to 7.25
Hocking screenings	5.50 to 6.75
Pomeroy lump	6.25 to 8.00
Pomeroy mine-run	6.00 to 7.50
Pomeroy screenings	5.75 to 7.50
West Virginia splint, lump	6.50 to 8.00
West Virginia splint, mine-run	6.25 to 7.75
West Virginia splint, screenings	6.00 to 7.50

CINCINNATI

Section Is Out of Coal and Dealers Plead for Supply — Industrial Plants Pay Any Price for Fuel—Householders Stock with Available Fuel, as Little Smokeless Is Obtainable.

The entire country from Cincinnati to the Northwest is out of coal. The long continued cold weather, lasting from early last fall until late this spring, completely used up the stocks and the coal dealers in every city, town, village and hamlet are pleading for even a meager supply. But with only two days' car supply per week at the mines during the last two months, the producers are not sending out much coal.

Dealers in Cincinnati have a limited stock and most of this has come down the Ohio River. It is next to impossible to get smokeless coal in the local field. In fact the market here is extremely short of certain grades of fuel. The large industrial plants, as well as the small industries are clamoring for coal and are paying any price for it.

Futile efforts are being made by the industrial users to get a reserve stock; they are disregarding prices, but are failing to lay in a stock simply because it is not to be had.

While prices at the mines advanced during the past three weeks, the retail price (delivered) in Cincinnati has not, remaining at the following figures:

Bituminous lump	$8@$8.25
Bituminous nut	7.25
Bituminous run-of-mine	6.75
Smokeless lump	9.25
Smokeless run-of-mine	8.50
Smokeless anthracite	14.00

MILWAUKEE

Coal Situation at Milwaukee Is Serious — Prices Will Go Higher Unless I. C. C. Interferes—Eastern Coals Are Not in the Market.

Watching, waiting, worrying—these three words fitly express the attitude and state of mind of the men at Milwaukee who are in a way responsible for the coal supply of a large area of territory. As to the market, there is none. There is no soliciting of trade, and the consumer takes what he can get.

Prices continue to be held at the April and May level. There is no denying that the situation is critical and that the Northwest is confronted with the possibility of a serious coal famine next winter.

There is a fair movement of anthracite, and the liberal deliveries of hard coal tend to allay anxiety on the part of the general public, but heavy users of soft coal are not in as tranquil a state of mind.

There is practically no eastern soft coal in the market, the receipts being absorbed to the limit. Illinois and Indiana coal can be had in limited quantities. Receipts by Lake thus far this year aggregate 207,460 tons of anthracite and 242,592 tons of soft coal, against 194,653 tons of the former and 995,153 tons of the latter during the same period in 1919.

MIDWEST REVIEW

Transportation Is Improving — Coal Prices Are Firm, with Mine-Run on a Par with Prepared Sizes—Embargoes Are Proposed To Relieve New England — Prices Stiffen Toward End of the Week.

The railroads serving the Middle West coal fields appear this week to be in better shape than at any time since they were returned to private ownership. We hear that the car supply in the Springfield district, as well as the coal-producing districts in northern Illinois, is quite good—in fact, over 50 per cent.

In the southern Illinois coal fields the situation is not so good, although cars are moving to the mines more freely than last week, or the week before. When talking to railroad men, one gets the impression that the c: r-supply question will improve slowly but steadily from now on.

The market continues to hold up quite strongly and in some cases steam sizes, such as mine-run and screenings, are bringing as high prices as the prepared sizes made for domestic use. This is, undoubtedly, because manufacturing interests are buying coal as fast as they can and in as great quantities as possible.

CHICAGO

Coal Comes in Fairly Well, Relieving Situation Somewhat—Best Coals Sell at Reasonable Prices—Inferior Fuels Held at Higher Rates.

Coal continues to come into the Chicago market in fairly satisfactory quantities. Retailers report that they now have a little reserve on hand and that the mines are making shipments to them in a fairly satisfastory manner, considering conditions in the market and the handicaps at the mines. Steam plants also are in better shape, and are in a position to use a little more discrimination in buying than heretofore.

Prices vary greatly in the different fields. Franklin County coal, perhaps the best coal produced in this territory, is still selling at fairly low prices, while other coals, not so good, either from a standpoint of quality or preparation, are bringing higher prices. Current prices, f.o.b. mines, are approximately as follows:

ILLINOIS		
Southern Illinois Franklin, Saline and Williamson counties:		Rate to Chicago
Prepared sizes	$3.50 to $6.00	$1.55
Mine-run	3.50 to 5.50	1.55
Screenings	3.25 to 4.50	1.55
Central Illinois Springfield District:		
Prepared sizes	$4.00 to $6.00	$1.32
Mine-run	4.00 to 5.00	1.32
Screenings	4.00 to 4.75	1.32
Northern Illinois		
Prepared sizes	$4.75 to $5.00	$1.24
Mine-run	4.50 to 5.00	1.24
Screenings	4.25 to 4.50	1.24

INDIANA

Clinton and Linton Fouth Vein:		Rate to Chicago
Prepared sizes	$5.00 to $6.00	$1.27
Mine-run	4.50 to 5.25	1.27
Screenings	4.25 to 4.50	1.27
Knox County Field Fifth Vein:		
Prepared sizes	$4.00 to $5.50	$1.37
Mine-run	4.00 to 4.75	1.37
Screenings	4.00 to 4.50	1.37
Brazil Block	4.75 to 4.50	1.27

EASTERN COALS

Pocahontas and New River coals		
Prepared sizes	$8.00 to $10.00	$2.65
Mine-run	7.00 to 10.00	2.65
West Virginia splint and gas coals		
Prepared sizes	$8.00 to $9.50	$2.65
Mine-run	7.25 to 8.25	2.65
Southeastern Kentucky Hazard, Harland and Big Sandy fields		
Prepared sizes	$7.00 to $9.00	$2.45
Mine-run	7.00 to 9.50	2.45

It will be noted in some cases there is quite a wide variation in prices. This is because some operators are sticking close to their April quotations to the trade, while others have disregarded them. The quotations given, it must be remembered, are current prices, and cover only coal produced and sold from day to day.

ST. LOUIS

Steam Coal and High-Grade Domestic Are Short—Southwest Plants Are Closing Down — Operators, Dealers and Steam Users Are Alarmed Over the Future.

Locally St. Louis is short of steam coal and high-grade domestic; in general the domestic demand is not what it should be and this is causing grave anxiety to the retail dealers.

The domestic call from the country is far greater than the available supply can take care of on any kind of coal. In many sections in the southwest, plants are closing down on account of no steam fuel.

In the Standard district the mines continue to get about two days a week on commercial coal and considerably better showing where railroad coal is loaded.

In the Mt. Olive field a little better running time is experienced and the railroad tonnage here is also heavy.

In the Carterville field two days a week is the commercial run on the Missouri Pacific. About three days work a week holds on the other roads, with better time where railroad coal is loaded.

The miners are generally satisfied and there is little or no labor trouble. The movement of cars throughout all fields is slower than normal.

Standard coal is quoted for St. Louis delivery at from $3.25 to $4.50 at the mines for domestic sizes and about the same for screenings and mine-run. Mt. Olive still continues to maintain circular prices of $3.00@$3.25 on all sizes, excepting washed, which is about $3.60.

The Carterville circular of $3.70 is not held. Some operators are getting $4.50@$5. In the Duquoin field nearly all operators have passed up their contracts and orders and are loading mine-run coal at $4.50.

DETROIT

Shortage of All Kinds of Fuel Is Serious Here—Local Soft-Coal Market Is Supplied Chiefly from Ohio — Dealers Are Unable To Fill Anthracite Orders.

Bituminous—In the matter of fuel supply, steam and domestic buyers in Detroit are seriously handicapped. Jobbers say conditions are not improving and that the shortage of bituminious coal is as serious as at any time since the war. There is said to be no free coal on the tracks, practically all of the stock sent here going directly from the mines to consumers.

Though small shipments are coming from Illinois and Indiana, the market is practically dependent on Ohio for its bituminous coal. Slack from that district is reported selling around $6.75 at the mines per short ton. Mine-run is quoted at $7 to $7.25 and lump is offered at $7.50. There has been some complaint among customers concerning shipments of low-grade coal.

Reports received by the jobbers indicate that shortage of cars is still preventing mines in nearly all districts from turning out more than the equivalent of two or three days' production in a week. Coal from West Virginia and Kentucky has nearly disappeared from the market and is received only in shipments applying on long-standing contracts. This coal, which was formerly the chief supply of Detroit manufacturers, is now being sent to tidewater, while prices are said to be at a level that renders it impracticable for local buyers of steam coal to purchase it.

Anthracite—From the viewpoint of the retailer and the consumer, the situation in the anthracite trade is quite unsatisfactory. Retailers are able to get very little coal and in consequence are unable to fill orders which were booked weeks ago. Their customers are becoming anxious over the delay.

Lake Trade—With the system of pooling Lake coal again in effect, as in 1918, shipments are still disappointingly small and many ships are unable to get cargoes for their upbound trips.

South

LOUISVILLE

Failure of Car Supply in Kentucky Fields Again Drives Prices Upward—Demand Is Heavy — Buyers Force the Market and Make the Price.

There has never been a time when the situation in the Kentucky fields was so chaotic as it is at the present time. Many operators are making no effort to get business, merely allowing buyers to bid up the price and accepting the highest offer. No contracts are being accepted; on orders taken, prices are open and subject to wire confirmation of the price at time of shipment.

Operators had a three-day supply of cars in early June, the following week showing but two day's operations, while for the past week many mines have worked less than two days, some only one day.

The prices of lump and screenings are practically the same as mine-run. Buyers are willing to accept any size of gas coal, at prices ranging above $9 a ton, running up even to $10.

Conditions indicate that the gas and byproduct companies, the public utilities, the railroads and the big industries are forcing the market. Domestic business is at a standstill as consumers will not pay the price and are waiting for something to happen.

There are practically no quotations on anything but mine-run as that is practically all that is being produced, and prices are about the same for all sizes.

Quotations for mine-run at mines are as follows:

Gas Coal	$9@$9.50
Non-gas	8@ 8.50
Western Kentucky	5@ 5.50

BIRMINGHAM

Coal Moves Somewhat Easier Due to Less Confiscation — Hot Weather and Strikes Curtail Production—The Little Spot Coal Available Is Taken at High Prices.

Although there has been no noticeable increase in the number of cars furnished the mines in this district over the previous week, reports indicate that coal is moving smoother and with less delay due to less confiscation by the railroads. Contract-fuel mines are getting about all the cars they need, and commercial operations receive a supply ranging from 45 to 50 per cent.

The extremely warm weather of the past week has brought about increased idleness on the part of mine labor generally, which under normal conditions works with quite a satisfactory degree of regularity. This labor delinquency is greatly curtailing coal production, as mines which have a full car supply are thus prevented from operating to capacity.

There has been no change in the mining regions of Bibb, Tuscaloosa and Walker counties, where local strikes have interfered with production at a number of smaller mines, the men still remaining away from work.

Activity in trade channels in confined chiefly to declining coal orders, which continue to come to brokers and selling agencies in great volume. There is no coal available or in sight, with which to care for additional business, and only a nominal amount is being taken on. The little spot coal that finds its way to market is absorbed at prices ranging from $4.50 to $7 per ton mines, regardless of grade.

Receipts of domestic coal are quite unsatisfactory to retailers who are trying to accumulate a supply for winter, as a number of the mines producing domestic sizes have been wholly or partly closed by strikes for several weeks, and transportation facilities are inadequate to move what could otherwise be mined.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Transportation Conditions Go from Bad to Worse in Second Week of June — Railroads Persist in Assigned-Car Practice — Little Commercial Coal Shipped — Suit Is Entered Against Railroads.

The second week of June brought many disappointments to operators of the Fairmont, Monongalia and other northern West Virginia regions. Transportation conditions were even worse than they had been during the first week of the month.

While mines on the Monongahela R.R. had a fairly large run of cars on Monday, every one of the 110 cars furnished on Tuesday was assigned. Summarizing conditions it is not believed that mines in northern West Virginia, on an average were able to produce more than 35 or 40 per cent of potential capacity.

With such a short car supply, it was next to impossible to load any commercial coal, since the railroads secured all the coal they wanted by the simple expedient of assigning cars. One effect of such a slim production was to increase the price of mine-run in northern West Virginia fields to about $9.25 a ton. On some days fully half the coal produced at various points was for railroad consumption.

That accounts for the limited tonnage movement to Tidewater, to Inland East and West markets and to the Lakes. Curtis Bay shipments over the Monongah division of the Baltimore & Ohio did not average more than 150 cars a day.

The climax to the inexcusable assignment of cars in northern West Virginia came on Saturday, June 12, when suit was entered in the Marion Circuit Court, against the Baltimore & Ohio R.R., to put a stop to the further assignment of cars, the suit involving a mandatory injunction as well as a demurrage phase.

PITTSBURGH

Lake Pooling Plan Has Not Increased Car Supply — Spot Prices Still Advance—Exports Disturb Market—Local Bankers Are Alarmed Over Situation.

Even the pooling of Lake coal shipments, together with Lake ore shipments, put into operation June 14, has not materially increased the supplies of cars to Pittsburgh district coal mines, thus far at least. A curious reflection of the pooling, however, is that several steel works in the district found themselves shorter of cars in the first few days than they had been, the extra shortage being attributed to the establishment of the coal pool.

Everywhere the Lake coal situation is recognized as serious and as absolutely demanding relief. This is admitted even by coal consumers in this district who have closed their works because they cannot secure coal, or cannot afford to pay market prices.

The spot market, and there is practically no other, since the buyer almost invariably requires car numbers, is trending upwards rather than downwards, and may be estimated on an average at nearer $10 than $8. The market, however, is narrow, for by far the major part of the production is going against contracts.

The greatest disturbance is caused by dealers seeking coal for export, such buyers being almost reckless in their bids. There is no restraining influence to price advances, since the conservative operators are tied up with contracts and the sellers of spot coal are chiefly small operators, who are not particularly interested in market stability. Some of the banking interests in Pittsburgh are greatly alarmed over the situation.

The spot market in general is quotable at $8@10, per net ton at mine, Pittsburgh district, steam and gas grades usually bringing approximately the same price, while byproduct runs close to $10.

CONNELLSVILLE

More Furnace Coke is Contracted, but Uncertainty Prevails—Market Value of Coal Should Affect Coke Price—Car Supplies Do Not Improve and Market Continues High.

In addition to the contracts for second-half furnace coke, reported a week ago, aggregating about 25,000 tons monthly, on a 4-to-1 ratio basis against basic pig iron at valley furnaces, several flat price contracts have been made for the second half, at between $10 and $12 per net ton at ovens. Quite a tense situation exists as to furnace-coke contracts, both sellers and buyers being beset with uncertainties, especially the furnacemen.

Thus, $12 as a flat price for coke for the second half of the year seems like a high one to consumers, but coal is bringing more than $8 in the open market and it requires 1½ tons of coal to make a ton of coke, so that from this viewpoint $12 coke is altogether too low.

There has been no material improvement in car supplies, and the region is running at about 75 per cent of the rate obtaining prior to the rail strike and traffic congestion. The heavy production of pig iron, now nearly if not quite equal to the March rate, indicates that the byproduct coke ovens are doing better than the Connellsville beehive ovens.

The spot market continues high, with limited demand and limited offerings, being quotable at about $15 for furnace and $16 for foundry coke, per net ton at ovens.

The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended June 12 at 185,230 tons, a decrease of 4,350 tons.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL.

	1920 Week	1920 Calendar Year to Date	1919 (a) Week	1919 (a) Calendar Year to Date
May 29*b*	9,568,000	211,925,000	7,938,000	175,077,000
Daily average	1,595,000	1,652,000	1,498,000	1,372,000
June 5*b*	9,122,000	221,048,000	8,927,000	184,004,000
Daily average *c*	1,650,000	1,650,000	1,488,000	1,377,000
June 12*d*	10,332,000	231,380,000	8,485,000	192,489,000
Daily average	1,722,000	1,657,000	1,414,000	1,379,000

ANTHRACITE

	1920 Week	1920 Calendar Year to Date	1919 (a) Week	1919 (a) Calendar Year to Date
May 29	1,834,000	34,888,000	1,298,000	31,649,000
June 5*b*	1,495,000	36,383,000	1,703,000	33,351,000
June 12*c*	1,895,000	38,278,000	1,695,000	35,047,000

BEEHIVE COKE

United States Total

Week Ended June 12*c* 1920	Week Ended June 5*b* 1920	Week Ended June 14 1919	1920 to Date	1919 to Date*a*
408,000	412,000	286,000	9,762,000	8,939,000

(*a*) Less one day's production during New Year's week to equalize number of days covered for the two years. (*b*) Revised from last report. (*c*) Subject to revision. All figures in net tons.

Middle Appalachian

LOGAN AND THACKER

Logan Mines Speed Up Production with More Empties to Load—Cars Come in from the West—Coal Goes to the Lakes and the West—Thacker Output Stagnates Due to Labor Troubles.

With transportation facilities on the Chesapeake & Ohio superior to those of previous weeks, Logan mines speeded up production during the second week of June.

It is estimated that Logan mines had about 500 more cars at their disposal than they had been able to secure for any weekly period during the two months preceding; it being possible therefore to increase production to about 165,000 tons—a gain of 25,000 tons.

The major part of the increase was due to a large number of empties turned over to the Chesapeake & Ohio by connecting lines, the Logan field, therefore, benefitting by the action taken by the Interstate Commerce Commission.

Even making allowances for the fact that production had climbed upward toward the middle of June not half of the potential capacity of the 115 mines in the field was being produced.

Debarred from shipping to Tidewater during the first half of the week, Logan producers had no recourse other than to increase Western and Lake shipments.

Difficulty was experienced in making contract deliveries because of the fact that so many cars were assigned for railroad fuel loading. It was impossible to produce much coal for spot sale, that being one of the reasons why a price of $9 a ton and higher was being offered for Logan mine-run at Tidewater.

No settlement of the labor troubles in the Thacker field was in sight by the middle of June. Leaders of the mine workers announced they are making progress in organizing the field but that was controverted by the operators.

Production was greatly stagnated as a result of the labor troubles in the Thacker district. The movement of Thacker coal was largely to Tidewater as it had been in previous weeks, no softening of prices.

POCAHONTAS AND TUG RIVER

Tug River Receives Better Supply of Cars—Yet Production is Less Than 50 Per Cent—More Cars Come in from West—Empties Are Scarce in the Pocahontas Field.

While conditions in the period ended June 12 seemed to have undergone improvement from a transportation standpoint in one part of the territory supplied by the Norfolk & Western, on the easterly end of this road in the Pocahontas field, mines were experiencing just as much difficulty as they have been doing all along, in securing barely enough cars to keep from shutting down entirely.

While there seemed to be more cars coming from or through Western gateways, yet the increase was not such as to materially increase production and certainly was not large enough for distribution to all fields reached by the Norfolk & Western.

The increase in the number of Western cars turned over to the Norfolk & Western was met by a corresponding increase in Western tonnage.

Mines in the Tug River region occupied a more advantageous position than mines in the neighboring Pocahontas field, the operators reporting a general though not marked improvement in the supply of cars, especially as compared with the same week in May.

The Tug River region received most of the benefit of the increased Western supply of empties. Despite the improvement shown production was less than 50 per cent.

Virtually the entire output was needed to meet contract obligations. The little spot coal available was bid for at $9 a ton and more; but the major part of the output of the field is under contract at about $5 a ton.

Little headway was made by Pocahontas mines in overcoming past losses, owing to the fact that cars were still scarce—so scarce, in fact, that as against a production of only about 235,000 tons, there was a loss of over 300,000 tons from a shortage of equipment alone.

Cars were being returned quite slowly from tidewater, where the bulk of Pocahontas coal was being billed. As nearly as can be estimated, Pocahontas mines were operated on just about a 40 per cent basis during the week ended June 12, or less than three days out of the six.

NORTHEAST KENTUCKY

Output Changes Little, Being About 45 Per Cent—Commission Should Adopt More Drastic Measures About Coal Cars—More Coal Goes to the West and Lakes—Prices Are Firm.

The second week of June brought no perceptible change in the Northeast Kentucky field insofar as any increase in production was concerned. Mines in the field named had perhaps 100 cars more than during the previous week, at least in that section supplied by the Chesapeake & Ohio and its branches, including the Big Sandy, Sandy Valley & Elkhorn and the Long Fork.

There was not more than an output of about 45 per cent in the Eastern Kentucky field. Little if any benefit had been derived from the effort of the Interstate Commerce Commission to divert a larger number of empties to eastern coal regions.

The general feeling in Northeast Kentucky coal circles, was that the commission would have to adopt more drastic regulations before securing any results, and would have to stop the promiscuous use of cars for the loading of sand, gravel and other commodities.

Despite the shortage of empties in Northeast Kentucky the run of cars was far and away in excess of May, last year, it being stated that Eastern Kentucky mines received about 1,500 cars more during May, 1920, than during May, 1919.

Kentucky producers shipped a larger proportion of their product than usual to Western markets and to the Lakes. The demand for steam and byproduct coal was running strong and spot coal was quite hard to obtain. As a result of the short supply, prices continued firm, Eastern Kentucky mine-run averaging $7.50 a ton or better.

The activities of the Kentucky High Cost Commission and Fair Price body are of no avail for the present at least by action of Federal Judge Walter Evans. He recently ruled that the amendment to the Lever Act was too vague to be enforceable, and dismissed a dozen or so cases held over to the Grand Jury following preliminary examination. Judge Evans did not hold the act unconstitutional, as several federal judges have, but did refuse to prosecute under it. This means that the High Cost Commission is powerless to appeal the cases, or do anything further until the Supreme Court finally rules in the matter of constitutionality.

VIRGINIA

Lacking Many Cars, Operators Coke Coal to Avoid Interruption to Operation—Railroads Assign Cars and Take Large Tonnage—Spot Coal Scarce and High Prices Prevail.

Inability to secure anything approaching an adequate supply of cars precluded mines in southwestern Virginia from making any headway in increasing their output during the weekly period ended June 12, there still being an approximate loss of 50,000 tons due to a shortage of empties.

In addition to the tonnage produced for shipment, however, some mines continued to coke a considerable tonnage of coal in order to avoid as much interruption to operation as possible.

Not only was the scant car supply a potent factor in holding back the production of commercial fuel, but assigned cars also interfered quite materially with shipments, railroads taking a very large proportion of the output of the field for their own use.

There was a comparatively small amount of commercial coal with which to meet contract obligations, and scarcely any tonnage to meet the heavy demand for spot fuel.

Prices were held about on the level heretofore existing, $7.50 and better being offered; higher prices prevailed for spot coal for Tidewater delivery.

Labor conditions in themselves were satisfactory; however, assigned-car plants were able to hold their miners better than plants without a preferential car supply.

NEW RIVER AND WINDING GULF

Winding Gulf Works Two-Thirds Time, New River Only Three Days Out of the Six—Car Supply Is Limited in All Fields—Tidewater Tonnage Keeps Up and Western Shipments Increase.

Ground was gained over previous weeks in the tonnage of coal mined in the Winding Gulf and New River fields, during the second week of June, by virtue of a somewhat increased car supply in both fields, the greatest gains being made, however, in the Winding Gulf region. But in neither field was there as large a production as an excellent car supply early in the week led operators to believe would be the case, the run of empties still being sub-normal.

As against a 25 per cent supply of cars during the period ended June 5, plants in the Winding Gulf district had about a 66 per cent car supply during the week following; mines were able to operate about four days out of the six on the Virginian Ry. However, mines reached by the Chesapeake & Ohio had only a 50 per cent supply and were limited to about three days' operation.

The hope of New River producers for three or four full-day operation, inspired by quite a favorable supply of cars on Monday was dissipated by a marked decline in the quota of cars furnished after the first of the week.

Even at mines having individual cars, there was not more than a 50 per cent production in the field, while other mines less fortunate were not able to produce that large a percentage.

Western shipments from the New River region were in somewhat larger volume than during the previous week; at the same time there was no decrease in tidewater tonnage. There was a very insistent demand for New River coal in New England as well as for export.

KANAWHA

Production Changes Little, Being About 45 Per Cent—Kanawha Is Embargoed at Tide Due to Congestion—High Prices Prevail.

While cars in the Kanawha field during the weekly period ended June 12 were somewhat more plentiful than had been the case during the previous week, the increase was almost negligible, carriers being far short of the mark in the distribution of empties. The production for the week was about 45 per cent.

While the percentage of allotment was running a little larger at mines supplied by the Kanawha & Michigan than by the Chesapeake & Ohio, during the first few days of the week, even on that road the supply faded away toward the end of the week.

Signs indicated a slight increase in the run of empties from the West but not a sufficient increase to restore conditions to anything approaching normal.

Between June 7 and June 10 the Chesapeake & Ohio west of Handley was closed to all Kanawha shipments for Tidewater. The road found it necessary to impose an embargo until it could relieve the congestion following slides on June 5. With Tidewater points closed for a few days, more coal was of course shipped to Western points, Lake consumers also participating in the increase.

Inasmuch as there was heavy assignment of cars for railroad fuel loading, there was only a little volume of commercial coal for shipment, especially spot, since producers were having a hard time even in taking care of contract obligations.

As a result of the reduced production, as much as $7.50 a ton was offered for Kanawha mine-run for Western delivery. The price was even higher for Tidewater delivery, running up to $9 a ton or more.

Canada

BRITISH COLUMBIA

Crow's Nest Output Is Increasing; Vancouver Island Decreases — Coal Is Supplanting Fuel Oil—Coke Production Way Below Former Output.

An analysis of the latest figures available relative to the coal production of British Columbia shows that, while the output of the mines of the Crow's Nest Pass Field is increasing, the production of Vancouver Island mines is declining slightly.

It is generally predicted that the shortage of fuel oil will increase the demand for coal. The collieries of Vancouver Island anticipate that the present fuel situation will affect their bunker trade.

Freight and passenger vessels are being re-converted into coal burners, and many of those under construction are designed for the use of the latter fuel. Consequently there should be an increase in the demand for coal shortly. Meanwhile the domestic demand has fallen off somewhat and production, as far as the coast mines are concerned, is about stationary.

Production in the Crow's Nest field, on the other hand, is climbing, a good market being found in supplying the Great Northern Ry. Coal is used in pulverized form in the operation of this railroad. The greater proportion of the Corbin coal is shipped to Spokane, Wash., a comparatively small quantity being taken by the Canadian Pacific Railway.

A recent development, the results of which may be of importance, is a shipment of coal to Winnipeg, Manitoba, by the Crow's Nest Pass Coal Co. This is an emergency shipment to meet a shortage caused by the lack of coal usually obtained from the coal fields of United States.

Eastern British Columbia and the Province of Alberta may be called on to meet the requirements of the Canadian Middle West to a greater extent in the future than in the past.

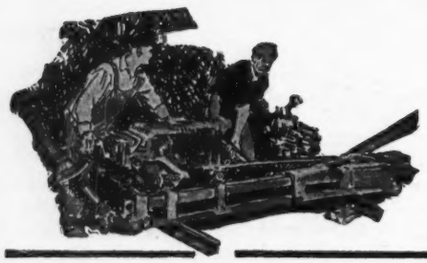
Coke production in the Crow's Nest field still is far below what it once was, the ovens at Fernie being idle and only some of those of Michel being in use. The product of these ovens is absorbed by the Canadian Consolidated Mining & Smelting Co. for the Trail smelter.

Operating Conditions at Coal Mines in Indiana, May, 1920

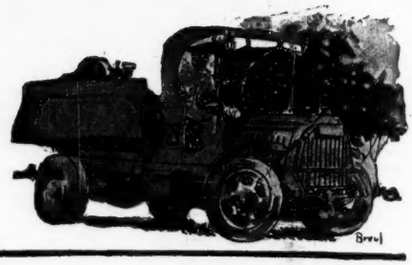
PREPARED BY JONAS WAFFLE, SECRETARY INDIANA COAL TRADE BUREAU

Railroads on Which Mines Are Located	District	No. of Mines	Tons Produced	Full Time Capacity (Tons)	— Tons Lost and Causes Therefor — Total All Causes	Car Shortage	Labor Trouble	Mine Disability
Big Four	Terre Haute	6	31,693	104,822	73,129	69,941	1,652	1,536
B. & O. S. W.	Vincennes	2	31,370	47,230	15,360	9,390	6,049	421
	Clinton	27	213,288	544,624	331,336	118,141	207,422	5,773
C. & E. I. (1)	(2) Sullivan	16	130,316	279,796	149,480	130,921	11,250	7,309
	Totals	43	343,604	824,420	480,816	249,062	218,672	13,082
C. I. & W.	Dana	1	9,035	10,309	1,274	453	821	.....
Cent. Ind.	Brazil	1	4,801	4,993	192	.....	.....	192
	Clinton	14	146,912	276,376	129,464	94,483	31,752	3,229
C. T. H. & S. E. (3)	Linton	27	14,937	368,679	226,742	186,227	36,564	3,951
	Totals	41	288,849	645,055	356,206	280,710	68,316	7,180
E. & I.	Clay City—Petersburg	10	57,252	179,649	122,397	118,041	3,217	1,139
E. & E.	Evansville	2	7,812	9,308	1,496	1,413	.....	83
E. S. & N.	Evansville	3	18,406	27,326	8,920	7,816	659	445
Ills. Cent.	Linton	6	48,855	104,705	55,850	53,480	1,987	383
Monon (4)	Linton	20	131,473	334,809	203,336	175,776	20,071	7,489
	(5) Main Line	20	143,509	350,585	207,076	170,563	25,579	10,934
P. C. C. & St. L.	(6) Vincennes	21	218,917	712,160	493,243	407,363	48,537	37,343
	Totals	41	362,426	1,062,745	700,319	577,926	74,116	48,277
	Ayrshire	9	30,584	120,534	89,950	85,526	3,825	599
Southern	Boonville	9	38,527	125,239	86,712	85,597	228	887
	Totals	18	69,111	245,773	176,662	171,123	4,053	1,486
Totals		194	1,404,687	3,601,144	2,196,457	1,715,131	399,613	81,713
Total month ending April 30, 1920		189	1,466,197	3,520,426	2,054,229	1,802,101	146,262	105,866

(1) Two mines served by two railroads.
(2) Includes all mines South of Terre Haute.
(3) One mine served by two railroads.
(4) Four mines served by two railroads.
(5) Includes all mines on St. Louis and Michigan Division.
(6) Includes all mines on Vincennes Division and Dugger Branch.



Mine and Company News



ALABAMA

Fort Payne—The Appalachian Coal & Iron Co., is planning for the development of a large tract of coal property in this section, and will acquire machinery and equipment for the purpose. It is proposed to erect a number of homes for miners at the plant. W. L. Smith is superintendent.

ILLINOIS

Duquoin—The Carlinville Mining Co., operating a mine at Carlinville, Macoupin County, north of here, has recently completed the erection of a concrete and steel tipple and hoisting has been resumed after an idleness of several months. The mine has been operating for some years. While the new tipple was being built, a number of other improvements were made around the mine, including repair work in the air shaft. New options have lately been taken out giving the company a larger territory for development. At the present time the plant is served by the Chicago & Alton R. R. but plans have been perfected whereby the Illinois Traction System will begin construction of a switch to the mine, greatly facilitating the problem of transportation. The Standard Oil Co., has also recently finished the sinking and erection of two mines near this plant.

Mount Vernon—The Southern Gem Coal Co., has purchased a block in the business section of this place with the intention of erecting a large modern 5-story building which will serve as headquarters for the northern terminal of the Wabash, Chester & Western R.R., a line which they recently acquired. The building also will be the coal headquarters for the company in southern Illinois. The company holds extensive tracts throughout this section, mostly, however, in Jefferson County. In addition to the new office building, the Southern Gem will erect a modern rescreening plant near the outskirts of Mt. Vernon, which will be served by the W. C. & W. and the Chicago & Eastern Illinois railroads.

KENTUCKY

Louisville—It is reported that the Louisville & Nashville R.R. has closed contracts for the entire output of six mines in the Hazard, Ky., field, the total production amounting to about 25 cars daily, this being about all the coal that will be required from the one district for railroad use. It is reported that the contract was closed at a price slightly under $4 a ton for mine-run. It is also reported that the L. & N., as well as other roads are buying better grades of coal today than formerly, they having discarded the cheap grades, which they formerly sought.

MARYLAND

Baltimore—The Eagle By-Products Collieries Co., Equitable Building, has incorporated with a capital of $750,000 to operate coal properties. George R. Curtis, Henry Ortman and Harry A. Mason are the incorporators.

NEW YORK

New York—The Crystal Coal Corporation recently organized under the Delaware laws with a capital stock of $1,000,000. It is sponsored by the Victor S. Fox interests which recently acquired control of the Consolidated Maritime Lines.

The new corporation is to engage in the sale and production of anthracite and bituminous coal, particularly for export. The close affiliation with the Consolidated Maritime Lines which is said to control over 200,000 tons of shipping, indicates that this new coal company may be a big factor in the export trade. Most of the Fox ships are now actively engaged in carrying coal to Italy, France and Scandinavia.

The new corporation is now acquiring the output of several mines and has purchased two large mines in the Fairmont and New River districts.

A deal is said to have been consummated recently involving the purchase of 25 coal producing properties in Pennsylvania, Ohio, West Virginia and Kentucky, at a cost of between $10,000,000 and $12,000,000, by John H. Jones, head of the Bertha Coal Co. and affiliated fuel companies.

It is said that the plan means that big industries of the United States and Canada are pooling their fuel requirements with an independent producing concern, instead of seeking coal as individuals. Mr. Jones admits that such a plan has been formulated.

The production of the Jones interests will exceed 12,000,000 tons of coal a year when contemplated improvements are completed.

A partial list of the newly acquired properties includes: The Sara mines, formerly operated by the West Virginia & Kentucky Coal Co. at Delna, Ky.; Jessie mines, formerly operated by the Smoot Creek Coal & Coke Co., at Delna, Ky., and Isabella mines, formerly operated by the Woodburn Coal Co., at Blackie, Ky. In addition, Mr. Jones has also leased from the Kentucky River Coal Corporation, 10,000 acres of coal lands and is rushing the development and equipment of the Elsie and Dorothy mines on this property.

In Ohio Mr. Jones acquired 1,600 acres of coal lands, together with a large number of houses in the town of Powhattan, and at Cresaps station, on the Baltimore & Ohio, the coal extending on both sides of the Ohio river at this point. Three shafts are now being sunk on the latter property.

NORTH DAKOTA

Dickinson—The McGillivary coal mine, four miles east of here, has been purchased by E. A. Hughes. Immediate improvements in the mine are planned by the new owner. The mine is said to be the largest on the main line of the Northern Pacific, and is ranked as one of the best lignite mines in North Dakota.

Modern machinery will be installed and the mine will be electrically operated. Electric current will be supplied to the mine from Dickinson.

The mine has been operated for several years, and has employed as high as 100 miners; Mr. Hughes plans to install sufficient machinery to make it possible to employ 200 men next fall and winter and to increase the capacity to 500-tons a day. The shafts now are sunk to a depth of about 125 feet.

The Beulah Coal Co., of which C. B. Little is president and in which Mr. Hughes is heavily interested, plans to open another mine either at Beulah or Hazen in an adjoining county.

OKLAHOMA

Tulsa—"Coal is the fuel Tulsa is going to have to turn to within a short time," John H. Leavall told members of the Chamber of Commerce, in presenting his plan for opening a large strip coal mine between Tulsa and Dawson.

"Fuel oil is now so high that it cannot be used for the generation of steam. It takes four barrels of oil to equal one ton of coal, and that would make $14 coal on a par with oil."

The company, now being organized by Mr. Leavall, will be capitalized at about $250,000 and is being financed by local business men. The operation will be carried on under the open shop plan.

OHIO

Steubenville—The Panhandle Collieries Co., which is putting in a large plant on the Pennsylvania R.R. west of here, has just about completed its 8-mile spur. A bridge across Cross Creek has also been finished and the work of

erecting the tipple and power plant will go forward. It is expected to start operations by Oct. 1 if not earlier. The mine will have a capacity of about 1,500 tons daily. J. W. Blower and the Hisylvania Coal Co. interests of Columbus are pushing the development.

PENNSYLVANIA

Pittston—The Pennsylvania Coal Co. is completing plans for the construction of a breaker near here to cost in excess of $200,000. William P. Jennings is superintendent.

Coversdale—The Pittsburgh Terminal Railroad & Coal Co., Wabash Building, Pittsburgh, Pa., has inaugurated work on a housing development for miners at its coal properties in the vicinity of Coversdale. Sixty two-story homes will be built.

Pittsburgh—The Vesta Coal Co. has acquired about 500 acres of coal lands in Washington County, heretofore held by J. C. Work and associates, Uniontown, at a price of about $550 an acre. Plans are under way to develop the property.

The Consolidated Coke Company, in the Oliver Building, of this place, is said to be planning for extensive work in connection with its coal mining properties. Arrangements are under consideration for the construction of a river tipple at Grays Landing, Fayette County, to be equipped with loading and conveying machinery to provide a capacity of about 4,000 tons a day. It is proposed to utilize the Monongahela River for transportation. The company recently completed negotiations for the acquirement of the Sharpneck mines of the Superior Coal Co. in the vicinity of Brownsville, Fayette County, including a tract of about 600 acres, and plans are being arranged for the complete electrification of this plant. It is proposed to increase capacity to about 2,000 tons daily. The consideration was to be in excess of $1,500,000.

It is said the Diamond Coal & Coke Co. has been granted a Federal permit for large extensions and improvements in its properties in the Barking Station mine, located on the Allegheny River, for increased capacity. The proposed work includes the construction of concrete ice-breakers, tipple, tipple pier, as well as other extensions.

Hazleton—The Lehigh Valley Coal Co., has begun preliminary work at the Stockton mines, east of this place, which have not been operated for some years past, and proposes to operate the property at maximum capacity, bringing considerable increased tonnage to the Hazleton Shaft colliery at Hazleton.

SOUTH DAKOTA

Aberdeen—Ralph Blair and his father have bought the John Meiger farm of 480 acres lying near this city and will open up the seam of soft coal which was discovered on the property some 10 or 12 years ago.

The Blairs are planning to install modern equipment and will begin digging coal in the near future.

The seam is said to lie within 70 to 90 ft. of the surface and to be eight ft. thick.

Ralph Blair paid $75,000 for the farm. His father, Gustave Blair, has also recently bought a farm in Faulk County, paying $165 an acre for 235 acres.

Mount Hope—V. S. Veazey, of this place, owner and developer of the Hi Top Mine, near Sun, W. Va. (operating a New River Seam), recently acquired a lease on the Boone coal on Packs Branch and has begun development; this comprises about 300 acres of the Long Branch seam. He is also sinking a shaft to open a tract of his at Glen Jean, W. Va., which carries the New River measures, this was at one time a part of the Sun lease (New River Collieries Co.). Shipments are expected to be made from one or both mines by August 1, and will be via the Virginian Ry.

WEST VIRGINIA

Wheeling—Charles F. Bachmann, of this place is understood to have completed negotiations for the purchase of approximately 3,000 acres of coal lands in the vicinity of Cresaps, near Moundsville, W. Va. It is said that plans are now in process of formation covering the installation of machinery and equipment for the development of the tract.

Fireco—The Wilton Smokeless Coal Co., recently organized with a capital of $350,000, is having plans prepared for the development of a total of about 650 acres of coal properties in the Fireco district. It is proposed to have a capacity of about 400 tons a day. J. W. Wilson, Wyco, W. Va., is president; C. H. Meador, vice-president, and J. B. Clifton, both of Beckley, W. Va., is secretary-treasurer.

CANADA

Ottawa—Coal-mining operations will be commenced in the new coal field near Lampman, Saskatchewan, within the next two months. This field is being developed by the Farmers' Coal Mining Co., Ltd., which is incorporated with a capitalization of half a million dollars.

Association Activities

Washington State Fuel Merchants' Association

The second annual convention of the Washington State Fuel Merchants' Association was held at Spokane, Wash., recently. By a unanimous vote of the convention, A. J. Davis, of Tacoma, was elected president; Roy Bungay, Spokane, vice-president; W. B. Monks, Seattle, secretary-treasurer. The offices of secretary and treasurer. which heretofore have been separate, will be combined hereafter.

The report of the resolutions committee indorsed a state-wide publicity campaign to awaken the coal consuming public to the necessity of storing their fuel during the spring and summer so that mine operators may keep their men employed more uniformly throughout the year, and that the public may be better protected against suffering resultant from a fuel shortage next winter.

Telegrams are to be sent to all senators and representatives from this state, asking them to work and vote for the passage of a bill providing for reduced freight rates on coal during the summer months.

Following an address on "Destination Weights," by Roy S. Brown, traffic expert with the Western Retail Lumbermen's Association, the question was generally discussed.

An address on "Cost Accounting" was given by Harvey S. Jordan, commissioner of the Retail Coal Merchants' Credit Association of Seattle. C. E. Arney, assistant supervisor of agriculture of the Northern Pacific Ry., also gave a talk on "Traffic Conditions."

Addresses were also given by W. J. Hindley on "Chasing the Profiteer" and by W. T. Prosser, of Seattle, on "Seasonal Coal Business."

Northern West Virginia Operators' Association

The validity of the assignment of cars will be tested in the courts. That course was decided upon at a meeting of the Northern West Virginia Operators' Association held at Fairmont on June 4.

Another meeting was planned for June 9 when Rush C. Butler, chief counsel for the National Coal Association was invited to be present to discuss the legal phases of the proposed suit.

Believing that the assigned-car practice is repugnant to the rules and regulations governing car distribution, the Northern West Virginia association proposes to seek relief from the Interstate Commerce Commission, from the federal courts and if necessary from Congress. It has been tentatively decided to bring the suits mentioned against the carriers direct.

Northern West Virginia operators made the charge that there was and had been a failure at Curtis Bay to dump coal promptly, with the result that there had been numerous embargoes and a marked increase in demurrage charges at this port. The association directed its vice-president, George T. Bell, to investigate the dumping situation and to see what it was possible to do.

Tidewater Coal Exchanges

Tidewater coal exchanges are now in full operation at Newport News, Sewall's Point and Lambert's Point. At Newport News, to which the Chesapeake & Ohio R.R. ships its coal, the arrangements provide for the railroad paying 75 per cent and the shippers 25 per cent of the expense. At Sewall's Point the expense is divided evenly between the railroad and the shippers.

Industrial News

Chicago, Ill.—The Chicago offices of The Cutler-Hammer Manufacturing Co., of Milwaukee and New York, have been removed from the Peoples Gas Bldg., where they have been located for the last eight years, to the company's own building (323 No. Michigan Ave.) on the new Michigan Boulevard link. Because of the rapidly growing business in the Chicago territory, the fifteen offices in the Peoples Gas Building were no longer large enough so that the new building was necessary. Considerable extra storage space is also available, which will make it possible to carry a larger amount of stock of standard apparatus and parts for ready delivery. H. L. Dawson is manager of the Chicago office, which handles the business of nineteen states with the sub-offices in Cincinnati and Detroit.

Kenosha, Wis.—The corporate name of the Macomber & Whyte Rope Co., of this place, has been changed to the MacWhyte Co.—effective June 1, 1920. No change in ownership, management, or policy of the company is involved.

The products of the MacWhyte Co. have for several years been known and advertised under the trade name, "MacWhyte." The change, therefore, brings the name of the company into line with the name of the products. Furthermore, the MacWhyte Co. manufactures not only wire rope, but also streamline wire, for airplanes, mine-car hitchings, safety detaching hooks for coal mines. George S. Whyte continues as president and general manager; Jessel S. Whyte as secretary, and E. W. Reitzel as treasurer.

Easton, Pa.—The Pennsylvania Pump & Compressor Co., of this place, announces the opening of its sales offices in the following cities: New York, N. Y., 50 Church St., H. C. Browne, manager; Philadelphia, Pa., 2222 Chestnut St., W. J. Devlin, manager; Pittsburgh, Pa., 631 Fulton Bldg., C. W. Gellinger, manager; Richmond, Va., Mutual Bldg., W. F. Delaney, manager; Birmingham, Ala., 2027 Jefferson Bank Bldg., H. I. Kahn, manager; Salt Lake City, Utah, Newhouse Bldg., C. H. Jones, manager; Milwaukee, Wis., 604 First Nat'l Bank Bldg., Coates & Zarling, representatives.

Orange, N. J.—The Edison Storage Battery Co. announces the recent appointment of Don C. Wilson as assistant sales manager in charge of its Railroad Department. Mr. Wilson has been active in railroad operating and mechanical affairs for many years, having been electrical engineer for the Union Pacific R.R., at Omaha, Neb., and in a similar capacity with the Central of Georgia at Savannah. The Edison Storage Battery Co.'s works are at Orange, N. J., with offices at 23 West 43rd St., New York City.

Personals

Richard H. Williams, of the firm of Williams & Peters, of No. 1 Broadway, New York City, has been elected as a Class B Director of the Federal Reserve Bank of New York. He succeeds W. B. Thompson. Mr. Williams is a director of the Pennsylvania Coal Co., a director and member of the executive committee of the Equitable Life Assurance Society and a director and member of the finance committee of the Atlantic Mutual Insurance Co.

A. F. Harper has resigned his position as division engineer of coal mines with the Woodward Iron Co., Dolomite, Ala., to accept the position of mining engineer with Sloss-Sheffield Steel & Iron Co., with headquarters in Birmingham, Ala.

George E. Land, who has been advertising manager of the Blaw-Knox Co., Pittsburgh, Pa., has gone into business for himself under the name of the Technical Publicity Co., of Pittsburgh, Pa.

T. H. Huddy, a well-known mining man of the Kanawha, W. Va., field, who for a number of years has been the general superintendent of the Boomer Coal & Coke Co. and of the Paint Creek Coal Mining Co., has been appointed general manager of the Williamson Coal & Coke Co. of the Bailey Coal Co. and of the Sudduth Coal Co. operating in the Thacker, W. Va., field, with headquarters at Williamson, W. Va. The companies mentioned have been recently purchased by A. H. Land and others.

J. L. Coombes, formerly mining engineer at the Lynch mines of the U. S. Coal & Coke Co., has recently returned to his old position as field engineer with the Fargo Engineering Co., at Battle Creek, Mich. He has spent six months at Temiskaming, Quebec, Can., as engineer for the Kippawa Co., Ltd.

Howard L. Smith, mining engineer, serving on the American Commission at Belgrade, Serbia, reports some interesting progress made in mining methods in the Balkan States. He expects to return to America in December.

F. A. Dalburg, consulting mining engineer has recently returned from Manila, Philippine Islands, where he was general manager of the National Fuel Co. He will take up consulting work again in this country with headquarters at 40 East 40th St., New York City. Mr. Dalburg's home address is Ralston, Pa.

Horatio C. Ray, who has been connected with the School of Mines of the University of Pittsburgh as Professor of Metallurgy and Ore Dressing, has resigned his position to take effect at the close of the present school year. Mr. Ray will become affiliated with the Keystone Consolidated Publishing Co., of Pittsburgh, and will have direct charge of the editing of the metallurgical section of the Coal Catalogue—one of this concern's publications.

Among the honors conferred at the commencement exercises of Columbia University, held recently at New York, was the awarding of the medal of the Class of '89, of the School of Mines, to **Robert Van Arsdale Norris.** The medal is given triannually to the alumnus who "distinguished himself most in the field of human endeavor." Mr. Norris received the honorary degree of Master of Science from the University in 1914.

The French society of civil engineers is to have a symposium on "Rational Utilization of Fuels," as a part of its June activities. **M. George Charpy** is in charge of the major plans of the program, and will deliver the principal paper.

H. H. Boyd, who has held the position of chief engineer of the Bell & Zoller Mining Co., at Zeigler, in Franklin County, Ill., for a number of years, has resigned to become assistant bridge engineer for the Missouri, Kansas & Texas Lines. He was formerly with the Burlington railroad as engineer.

Bert Lloyd, Colorado representative of the Colorado-American Coal Co., of Milwaukee, Wis., is opening an office in Colorado Springs, Col., in which he will conduct a general coal-mining engineering practice.

John B. T. Jones, superintendent of the Laflin colliery of the Hudson Coal Co., has been appointed superintendent of the Pine Ridge colliery of the same company, succeeding John J. Walsh who has not been reassigned as yet. The headquarters of the Hudson company is at Scranton, Pa.

W. Guy Sroder, of Charlerol, Pa., who recently resigned as general superintendent of the Diamond Coal & Coke Co., of Pittsburgh, Pa., following the passing of the control of that company to the Hillman interests, has accepted a similar position in charge of the coal operations of the Shenango Furnace Co., at Willpen, Westmoreland County, Pa. The plant is on the Ligonier Valley R. R., four miles from Ligonier. Mr. Sroder now lives at Ligonier and has his office at Willpen.

Joseph H. Beek has been appointed Traffic Director of the St. Paul Association, at St. Paul, Minn., as Executive Secretary, in the place of Guy M. Freer, deceased. Mr. Beek assumed the duties of this office on June 1.

R. V. Norris, Jr., who has been chief mining engineer of the Lehigh Coal & Navigation Co., of Lansford, Pa., for the past year, has resigned his position to take effect June 1. Mr. Norris is leaving for California and has not as yet decided as to his future activity. The Navigation company has not announced any successor to Mr. Norris.

Morgan A. Morgan, who has just been appointed superintendent of the coal mine at Black Diamond, was the guest of honor at a district meeting of the Mount Rainier Sportsmen's Association at Burnett, Wash., recently. More than 150 members of the organization attended. During the meeting Mr. Morgan was presented with a gold watch, the gift of the men with whom he has worked while superintendent of the Burnett mine.

Fred W. Price, who has recently been with a large mining company in Colorado and formerly located at Duquoin, Ill., has returned to Illinois to accept a responsible position with the Victory Collieries Co., operating at Tamaroa, Ill.

Coming Meetings

American Mining Congress will hold its annual meeting at Denver, Col., Nov. 15. Secretary, J. F. Callbreath, Munsey Building, Washington, D. C.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting Aug. 20 to Sept. 3. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

National Exposition of Chemical Industries will hold its sixth exposition Sept. 20 to 25, inclusive, at the Grand Central Palace, New York City.

American Institute of Electrical Engineers holds annual convention at White Suiphur Springs, W. Va., June 29 to July 2. Secretary, F. L. Hutchinson, New York, N. Y.

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Illinois and Wisconsin Retail Coal Dealers' Association's annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

Indiana State First Aid Meet at Clinton, Ind., July 5, under the auspices of the Indiana State First Aid Association, with the co-operation of the Clinton First Aid Association, Chamber of Commerce, Indiana Coal Operators' Association, United Mine Workers of America, Bureau of Mines, and State Mine Inspection Department.

The Rocky Mountain Coal Mining Institute, in conjunction with the **Colorado Metal Mining Association,** the local chapters of the American Mining Congress and the American Institute of Mining & Metallurgical Engineers, and the International First-Aid Meet, will hold its annual meeting Sept. 9, 10 and 11 at Denver, Col. Secretary, F. W. Whiteside, Denver, Col.

National Safety Council will hold its 1920 congress on Sept. 27 to Oct. 1 inclusive at Milwaukee, Wis. General manager, C. W. Price, Chicago, Ill.

Oklahoma Coal Operators' Association will hold its annual meeting Sept. 14 at McAlester, Okla. Secretary, F. F. LaGrave, McAlester, Okla.

Obituary

Robert H. Lindsay, aged 40, a mining engineer of Seattle, Wash., was killed recently by falling down the shaft of a mine in Butte, Mont. Mr. Lindsay was making an inspection of an old workings owned by James A. Murray of Seattle and Butte, when he met with the fatal accident. He was married 12 years ago in Virginia City, Mont.

James Dunsmuir, son of the late Robert Dunsmuir, the first large coal-mine operator of Vancouver Island and former Premier and Lieutenant-Governor of British Columbia, died suddenly on June 5. The name of Dunsmuir is identified inseparably with the development of the coal measures of western Canada. James Dunsmuir sold the Wellington, Comox and Alexandria collieries in 1910 to Messrs. MacKenzie and Mann for approximately ten million dollars. He still retained, however, the coal in the remaining area of the Esquimalt & Nanaimo Ry. land belt, title to which subsequently passed to the Canadian Collieries Ltd., in which concern he was heavily interested at the time of his death.

Samuel Flory died of heart failure recently at his home in Bangor, Pa., at the age of 66 years. Mr. Flory was interested in a number of corporations, the principal one being the manufacturing plant founded by him 44 years ago, known as the S. Flory Manufacturing Co., of which he was the head during these many years. The Flory company's suspension cableways and hoists have been in operation in the slate, coal and quarry regions of the United States and Canada for over 40 years. Surviving Mr. Flory are his widow and three children.